



بنك اختبارات قدرات الرياضيات

للمدارس الخاصة

إهداء إلى كل طلابنا الأعزاء

مع خالص تمنياتنا لكم بالتوفيق والنجاح

د. محمد العجمي



MATHEMATICS APTITUDE

Mock Exam 1



The exam is exactly 60:00 minutes



Wear a wrist watch



Sit in a quiet room



White paper and pencils only



Darken the circles correctly



Respect the rules. Never look at the key before you finish

1. A man invests 34,000 KD in two different businesses. The first business yields a 12% annual profit, but the second business suffers a 5% annual loss. If his overall net profit for the year is exactly zero, how much money did he invest in the first business?
- (a) 10000 KD (c) 17000 KD
(b) 24000 KD (d) None of the previous
2. $S = 2\pi rh + 2\pi r^2 \implies h =$
- (a) $\frac{S}{2\pi r} - r$ (c) $\frac{S-r}{2\pi r}$
(b) $\frac{S}{2\pi r} + r$ (d) $\frac{S-2\pi r}{2\pi r^2}$
3. $6m^2n^3 - 15m^3n^2 - 9m^4n =$
- (a) $3m^2n(n-3m)(2n+m)$ (c) $(n-3m)(2n+m)$
(b) $3m^2n(n+3m)(2n-m)$ (d) $3m^4n^3(2n^{-2} - 5m^{-1}n^{-1} - 3)$
4. The average of $x, 3x, 5x, 7x$, and $9x$ is 25. What is the value of the largest number in the set?
- (a) 5 (c) 35
(b) 25 (d) None of the previous
5. $-3x(2x-5) - (x-2)(3x+1) =$
- (a) $-9x^2 + 5x + 2$ (c) $-3x^2 + 20x - 2$
(b) $-9x^2 + 20x + 2$ (d) None of the previous
6. A square is drawn perfectly inside a circle of radius $5\sqrt{2}$ cm such that all four corners of the square touch the circle. What is the exact area of the region that is inside the circle but outside the square?
- (a) $50\pi - 100 \text{ cm}^2$ (c) $50\pi - 50 \text{ cm}^2$
(b) $50\pi - 200 \text{ cm}^2$ (d) None of the previous
7. Given $k > 0$, if the equation $9x^2 + kx + 16 = 0$ has exactly one real solution, find that solution:
- (a) $4/3$ (c) $-3/4$
(b) 24 (d) None of the previous
8. The solution set of the equation $\frac{|x+2|}{x+2} + x^2 = 1$ is:
- (a) $\{0, -\sqrt{2}\}$ (c) $\{0, \sqrt{2}\}$
(b) $\{0\}$ (d) None of the previous

9. The price of a piece of land increased by 25%. By what percentage must the new price be reduced to return it exactly to its original price?
- (a) 25% (c) 33.3%
(b) 75% (d) None of the previous
10. Let $f(x) = x^3 - 2^{k+1}$. If $f(-2) = -24$, find the value of k :
- (a) 3 (c) 4
(b) 2 (d) None of the previous
11. A machine produces x items per hour. After working for exactly 4 hours, the machine's speed is doubled. If the total production after a total of 6 hours is 1200 items, what is the value of x ?
- (a) 150 (c) 300
(b) 200 (d) None of the previous
12. $(2^{-1} + 3^{-1})^{-1} =$
- (a) 5 (c) $\frac{6}{5}$
(b) $\frac{5}{2}$ (d) $-\frac{1}{5}$
13. $\frac{x^2 - y^2}{\sqrt{x + y}} =$
- (a) $(x - y)\sqrt{x + y}$ (c) $x - y$
(b) $\sqrt{x - y}$ (d) None of the previous
14. A farm has enough feed to sustain 120 cows for exactly 40 days. If the farmer buys x more cows, the same feed will last exactly 30 days. What is the value of x ?
- (a) 40 (c) 90
(b) 160 (d) None of the previous
15. $2 - \left(\frac{3}{8} + \frac{5}{6}\right) =$
- (a) $\frac{59}{24}$ (c) $\frac{19}{24}$
(b) $\frac{11}{6}$ (d) 19
16. A boutique owner buys a batch of 40 identical dresses. If she sells each dress at a profit of 25% of its cost, how many dresses must she sell to exactly cover the cost of the original 40 dresses?
- (a) 32 (c) 10
(b) 30 (d) None of the previous

17. The domain of $f(x) = \frac{\sqrt{x+2}}{x-2}$ is:

(a) $[-2, \infty)$

(c) $\mathbb{R} \setminus \{2\}$

(b) $[-2, 2) \cup (2, \infty)$

(d) None of the previous

18. The set of all real values of x that satisfy $x + 9 > 6\sqrt{x}$ is:

(a) $[0, 9) \cup (9, \infty)$

(c) $\mathbb{R} \setminus \{9\}$

(b) $(9, \infty)$

(d) None of the previous

19. A swimmer can swim 2 km upstream against a current in the exact same amount of time it takes them to swim 5 km downstream with the current. If the speed of the current is 3 km/h, what is the swimmer's speed in still water?

(a) 5 km/h

(c) 21 km/h

(b) 10 km/h

(d) None of the previous

20. Find the set of all real values of x that satisfy $\frac{4}{x-3} > x$:

(a) $(-\infty, -1) \cup (3, 4)$

(c) $(4, \infty)$

(b) $(-1, 4) \setminus \{3\}$

(d) None of the previous



Answer Sheet

Mathematics · Mock Exam 1

Use a pencil. Fill the circle completely.

Correct



Wrong



Q's# Answers

1 – (A) (B) (C) (D)

2 – (A) (B) (C) (D)

3 – (A) (B) (C) (D)

4 – (A) (B) (C) (D)

5 – (A) (B) (C) (D)

Q's# Answers

6 – (A) (B) (C) (D)

7 – (A) (B) (C) (D)

8 – (A) (B) (C) (D)

9 – (A) (B) (C) (D)

10 – (A) (B) (C) (D)

Q's# Answers

11 – (A) (B) (C) (D)

12 – (A) (B) (C) (D)

13 – (A) (B) (C) (D)

14 – (A) (B) (C) (D)

15 – (A) (B) (C) (D)

Q's# Answers

16 – (A) (B) (C) (D)

17 – (A) (B) (C) (D)

18 – (A) (B) (C) (D)

19 – (A) (B) (C) (D)

20 – (A) (B) (C) (D)

STOP

Do not turn to the next page

The answer key is next. Keep it hidden until you have finished the whole exam.



Answer Key Mathematics · Mock Exam 1 · correct answers shaded

Q's#	Answers	Q's#	Answers	Q's#	Answers	Q's#	Answers
1 –	A B C D	6 –	A B C D	11 –	A B C D	16 –	A B C D
2 –	A B C D	7 –	A B C D	12 –	A B C D	17 –	A B C D
3 –	A B C D	8 –	A B C D	13 –	A B C D	18 –	A B C D
4 –	A B C D	9 –	A B C D	14 –	A B C D	19 –	A B C D
5 –	A B C D	10 –	A B C D	15 –	A B C D	20 –	A B C D

Learn from your mistakes

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MATHEMATICS APTITUDE

Mock Exam 2



The exam is exactly 60:00 minutes



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1. A printing press uses 5 identical machines working h hours a day to print a newspaper edition in 6 days. If 3 more machines are added and the job must be finished in 4 days, how many hours a day must the machines run?
- (a) $\frac{15h}{16}$ (c) $\frac{15}{16h}$
 (b) $\frac{8h}{15}$ (d) $\frac{32}{30h}$
2. The value of m that makes $x^2 + 18x - 2m$ a perfect square is
- (a) 9 (c) $-\frac{81}{2}$
 (b) -9 (d) $\frac{81}{2}$
3. $2 - \frac{8}{9} \times \frac{3}{4} + \frac{1}{6} =$
- (a) 1 (c) $\frac{7}{6}$
 (b) $\frac{3}{2}$ (d) $\frac{5}{9}$
4. A fruit seller has a crate of oranges. He discards 10% of the oranges because they are rotten. He then divides the rest for local sale and export in a ratio of 3 : 2. If he exported exactly 72 kg of oranges, what was the initial mass of the crate?
- (a) 200 kg (c) 144 kg
 (b) 180 kg (d) None of the previous
5. $\frac{x}{\sqrt{x+1}-1} - \sqrt{x+1} =$
- (a) 1 (c) 0
 (b) x (d) None of the previous
6. Runner M and Runner N are on a 600 m circular track. They start at the same point and run in the same direction. Runner M is faster and laps Runner N exactly once every 5 minutes. If Runner M completes one full lap of the track in 100 seconds, what is the speed of Runner N in meters per second?
- (a) 4 m/s (c) 8 m/s
 (b) 2 m/s (d) None of the previous
7. $\frac{2\sqrt{20} + 3\sqrt{45}}{\sqrt{80}} =$
- (a) $\frac{5}{4}$ (c) $\frac{5\sqrt{13}}{4}$
 (b) $\frac{13}{4}$ (d) 9

8. Find the solution set of the inequality $||x - 1| - 3| < 1$:
- (a) $(-3, 5)$ (c) $(-3, -1) \cup (3, 5)$
 (b) $(-1, 3)$ (d) $(-\infty, -3) \cup (5, \infty)$
9. A businessman borrows 50,000 KD from two different banks to start a company. Bank A charges 6% annual interest and Bank B charges 9% annual interest. After exactly one year, he pays a total of 3900 KD in interest. How much did he borrow from Bank A?
- (a) 20000 KD (c) 25000 KD
 (b) 30000 KD (d) None of the previous
10. What is the solution set for the equation $x - \sqrt{x - 1} = 3$?
- (a) $\{5\}$ (c) $\{2\}$
 (b) $\{2, 5\}$ (d) $\{1, 3\}$
11. The perimeter of a rectangle is equal to the circumference of a circle with a radius of 14 cm. If the width of the rectangle is 4π cm, what is the exact area of the rectangle in terms of π ?
- (a) $40\pi^2 \text{ cm}^2$ (c) $56\pi \text{ cm}^2$
 (b) $80\pi^2 \text{ cm}^2$ (d) None of the previous
12. The domain of $f(x) = \frac{5}{\sqrt{x^2 + 16}} - \frac{x}{x - 2}$ is:
- (a) $\mathbb{R} \setminus \{\pm 4, 2\}$ (c) $\mathbb{R}$
 (b) $(-4, 4) \setminus \{2\}$ (d) None of the previous
13. $\frac{x^3 + 1}{x + 1} = (x - 1)^2 + 3x \implies x =$
- (a) 0 (c) -1
 (b) 1 (d) None of the previous
14. A reservoir holds enough water to supply a city of 120,000 residents for exactly 50 days. If the city's population increases by 30,000 residents, how many days will decrease from the water consumption duration?
- (a) 10 (c) 200
 (b) 40 (d) None of the previous
15. $x^{-\frac{1}{3}}(x + 3)\left(x^{\frac{1}{3}} - 1\right) =$
- (a) $x - x^{\frac{2}{3}} + 3 - 3x^{-\frac{1}{3}}$ (c) $x + x^{\frac{2}{3}} + 3 + 3x^{-\frac{1}{3}}$
 (b) $x - x^{\frac{1}{3}} + 3 - 3x^{-\frac{1}{3}}$ (d) None of the previous

- 16.** A rectangular floor measuring 150 cm by 210 cm is to be completely covered with identical square tiles. To use the minimum number of tiles, what is the total number of tiles needed?
- (a) 35 (c) 105
(b) 30 (d) None of the previous
- 17.** Find the set of all real values of x that satisfy $\frac{2}{x} > \frac{1}{x-2}$:
- (a) $(4, \infty)$ (c) $(0, \infty)$
(b) $(0, 2) \cup (4, \infty)$ (d) None of the previous
- 18.** If $f(x) = x^2 + 4^k$, and $f(2) = 20$, find the value of k :
- (a) 1 (c) 16
(b) 4 (d) None of the previous
- 19.** The price of a book is 20% less than the price of a backpack. If the total cost of purchasing one book and one backpack is 54 KD, what is the price of the book?
- (a) 30 KD (c) 43.2 KD
(b) 10.8 KD (d) None of the previous
- 20.** What is the solution set of the inequality $\frac{x}{x-2} < 3$?
- (a) $(-\infty, 2) \cup (3, \infty)$ (c) $(-\infty, 3) \setminus \{2\}$
(b) $(2, 3)$ (d) None of the previous



Answer Sheet

Mathematics · Mock Exam 2

Use a pencil. Fill the circle completely.

Correct



Wrong



Q's# Answers

1 – ☐ A ☐ B ☐ C ☐ D

2 – ☐ A ☐ B ☐ C ☐ D

3 – ☐ A ☐ B ☐ C ☐ D

4 – ☐ A ☐ B ☐ C ☐ D

5 – ☐ A ☐ B ☐ C ☐ D

Q's# Answers

6 – ☐ A ☐ B ☐ C ☐ D

7 – ☐ A ☐ B ☐ C ☐ D

8 – ☐ A ☐ B ☐ C ☐ D

9 – ☐ A ☐ B ☐ C ☐ D

10 – ☐ A ☐ B ☐ C ☐ D

Q's# Answers

11 – ☐ A ☐ B ☐ C ☐ D

12 – ☐ A ☐ B ☐ C ☐ D

13 – ☐ A ☐ B ☐ C ☐ D

14 – ☐ A ☐ B ☐ C ☐ D

15 – ☐ A ☐ B ☐ C ☐ D

Q's# Answers

16 – ☐ A ☐ B ☐ C ☐ D

17 – ☐ A ☐ B ☐ C ☐ D

18 – ☐ A ☐ B ☐ C ☐ D

19 – ☐ A ☐ B ☐ C ☐ D

20 – ☐ A ☐ B ☐ C ☐ D

STOP

Do not turn to the next page

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Answer Key Mathematics · Mock Exam 2 · correct answers shaded

Q's#	Answers	Q's#	Answers	Q's#	Answers	Q's#	Answers
1 –	A B C D	6 –	A B C D	11 –	A B C D	16 –	A B C D
2 –	A B C D	7 –	A B C D	12 –	A B C D	17 –	A B C D
3 –	A B C D	8 –	A B C D	13 –	A B C D	18 –	A B C D
4 –	A B C D	9 –	A B C D	14 –	A B C D	19 –	A B C D
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MATHEMATICS APTITUDE

Mock Exam 3



The exam is exactly 60:00 minutes



Wear a wrist watch



Sit in a quiet room



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Darken the circles correctly



Respect the rules. Never look at the key before you finish

1. The average of a set of 10 positive integers is 12. If the largest integer is removed, the average of the remaining 9 integers becomes 10. What was the value of the removed integer?
- (a) 30 (c) 120
(b) 20 (d) 90
2. $25x - 20\sqrt{x} + 4 =$
- (a) $(5\sqrt{x} + 2)^2$ (c) $(5\sqrt{x} - 4)^2$
(b) $(5\sqrt{x} - 2)(5\sqrt{x} + 2)$ (d) None of the previous
3. Find the real solution for the equation $|x + 6| - 4\sqrt{x + 6} = 5$:
- (a) 19 (c) -5
(b) 25 (d) None of the previous
4. What is the logical negation of the statement: " $x \geq 4$ or 10 is not a prime number"?
- (a) $x < 4$ and 10 is a prime number (c) $x < 4$ or 10 is a prime number
(b) $x \leq 4$ and 10 is a prime number (d) $x < 4$ and 10 is not a prime number
5. What is the solution set of the inequality $-2 \leq \frac{1 - 4x}{3} < 3$?
- (a) $(-2, 7/4]$ (c) $(-7/4, 2]$
(b) $[-2, 7/4)$ (d) None of the previous
6. Train A leaves a station at a constant speed of 60 km/h. Two hours later, Train B leaves the same station, traveling in the same direction on a parallel track at 90 km/h. How many kilometers from the station will Train B overtake Train A?
- (a) 360 km (c) 240 km
(b) 120 km (d) None of the previous
7. $(2x^2 - x + 4)(x - 3) =$
- (a) $2x^3 - 7x^2 + 7x - 12$ (c) $2x^3 - 5x^2 + 7x - 12$
(b) $2x^3 - 7x^2 + 1x - 12$ (d) None of the previous
8. $\frac{|x|}{x} + \frac{x}{|x|} =$
- (a) $\frac{2x}{|x|}$ (c) 0
(b) 2 (d) None of the previous

9. Worker A can paint n rooms in 10 days, and Worker B can paint n rooms in 5 days. Working together, how many days will it take them to paint exactly $3n$ rooms?
- (a) 15 (c) 10
(b) 7.5 (d) 5
10. A "fixed point" of a function f is a real number x such that $f(x) = x$. Find the sum of all fixed points for the function $f(x) = x^2 - 7x + 15$:
- (a) 7 (c) -8
(b) 15 (d) None of the previous
11. The ratio of apples to oranges is $4 : 5$, and the ratio of oranges to bananas is $2 : 3$. If there are exactly 30 bananas, how many total pieces of fruit are there in the basket?
- (a) 66 (c) 75
(b) 33 (d) None of the previous
12. The domain of $f(x) = \frac{x^2 - 9}{\sqrt[3]{x^2 + 9}}$ is:
- (a) $\mathbb{R}$ (c) $(-\infty, -3) \cup (3, \infty)$
(b) $\mathbb{R} \setminus \{\pm 3\}$ (d) $(-3, 3)$
13. What is the solution set of the equation $(x - 5)^2 = 2x - 10$:
- (a) $\{5, 7\}$ (c) $\{5\}$
(b) $\{5, 2\}$ (d) ϕ
14. A company reduced its workforce by 15%. If the company now has 510 employees, how many employees were laid off?
- (a) 76.5 (c) 600
(b) 90 (d) None of the previous
15. Which interval satisfies both inequalities $x^2 - 9 < 0$ and $2x - 1 \geq 3$?
- (a) $[2, 3)$ (c) $(-3, 2]$
(b) $(3, \infty)$ (d) $(-\infty, 3)$
16. Sphere A has a surface area exactly 9 times the surface area of Sphere B. If the volume of Sphere B is V , what is the volume of Sphere A in terms of V ?
- (a) $27V$ (c) $3V$
(b) $9V$ (d) $81V$

17. The solution set for the inequality $\frac{x}{x-8} > 0$ is:

(a) $(0, \infty) \setminus \{8\}$

(c) $\mathbb{R} \setminus (8)$

(b) $\mathbb{R} \setminus [0, 8]$

(d) None of the previous

18. $\frac{(2a^2b^{-1}c^3)^3}{4a^6b^{-3}c^0} =$

(a) $\frac{c^9}{2}$

(c) $2c^8$

(b) $\frac{2b^5c^6}{a}$

(d) $2c^9$

19. The frequency f of a vibrating string is inversely proportional to its length L and directly proportional to the square root of its tension T . If $f = 100$ Hz when $L = 30$ cm and $T = 36$ N, what is the value of f when $L = 45$ cm and $T = 81$ N?

(a) 100

(c) 225

(b) 150

(d) 75

20. $(2x + 1)^2 - 4(x - 1)^2 = 12x \implies x =$

(a) $1/4$

(c) $-3/4$

(b) 0

(d) None of the previous



Answer Sheet Mathematics · Mock Exam 3

Use a pencil. Fill the circle completely. Correct  Wrong   

Q's#	Answers	Q's#	Answers	Q's#	Answers	Q's#	Answers
1 –	☐ A ☐ B ☐ C ☐ D	6 –	☐ A ☐ B ☐ C ☐ D	11 –	☐ A ☐ B ☐ C ☐ D	16 –	☐ A ☐ B ☐ C ☐ D
2 –	☐ A ☐ B ☐ C ☐ D	7 –	☐ A ☐ B ☐ C ☐ D	12 –	☐ A ☐ B ☐ C ☐ D	17 –	☐ A ☐ B ☐ C ☐ D
3 –	☐ A ☐ B ☐ C ☐ D	8 –	☐ A ☐ B ☐ C ☐ D	13 –	☐ A ☐ B ☐ C ☐ D	18 –	☐ A ☐ B ☐ C ☐ D
4 –	☐ A ☐ B ☐ C ☐ D	9 –	☐ A ☐ B ☐ C ☐ D	14 –	☐ A ☐ B ☐ C ☐ D	19 –	☐ A ☐ B ☐ C ☐ D
5 –	☐ A ☐ B ☐ C ☐ D	10 –	☐ A ☐ B ☐ C ☐ D	15 –	☐ A ☐ B ☐ C ☐ D	20 –	☐ A ☐ B ☐ C ☐ D



Do not turn to the next page

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Answer Key Mathematics · Mock Exam 3 · correct answers shaded

Q's#	Answers	Q's#	Answers	Q's#	Answers	Q's#	Answers
1 –	A B C D	6 –	A B C D	11 –	A B C D	16 –	A B C D
2 –	A B C D	7 –	A B C D	12 –	A B C D	17 –	A B C D
3 –	A B C D	8 –	A B C D	13 –	A B C D	18 –	A B C D
4 –	A B C D	9 –	A B C D	14 –	A B C D	19 –	A B C D
5 –	A B C D	10 –	A B C D	15 –	A B C D	20 –	A B C D

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MATHEMATICS APTITUDE

Mock Exam 4



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1. A construction crew of m workers can build a wall in d days. If the company wants to finish the wall 3 days earlier, which of the following expressions represents the total number of workers required, assuming all workers build at the same constant rate?
- (a) $\frac{md}{d-3}$ (c) $\frac{md}{3}$
(b) $\frac{m(d-3)}{d}$ (d) None of the previous
2. Find the solution set of the inequality $x^3 - 3x^2 - 4x + 12 \geq 0$:
- (a) $[-2, 2] \cup [3, \infty)$ (c) $(-\infty, -2] \cup [2, 3]$
(b) $[-2, 3]$ (d) None of the previous
3. $\frac{1}{1 - \frac{1}{1-p}} + \frac{1}{p} =$
- (a) 1 (c) $\frac{2-p}{p}$
(b) 0 (d) None of the previous
4. A factory produces x printers. The production cost is 50 KD per printer for the first k printers, and 30 KD for every printer produced after that. If all printers are sold at a fixed price of 80 KD each, which expression represents the total profit earned from producing and selling x printers?
- (a) $50x - 20k$ (c) $50x + 20k$
(b) $80x - 50k$ (d) None of the previous
5. The domain of $f(x) = \sqrt{-x^4 + 5x^2 - 4}$ is:
- (a) $[-2, -1] \cup [1, 2]$ (c) $(-\infty, -2] \cup [-1, 1] \cup [2, \infty)$
(b) $[-2, 2]$ (d) ϕ
6. A factory produces a batch of microchips, but 5% are defective and discarded. Of the remaining functional microchips, 20% fail the quality control test and are also discarded. What total percentage of the original batch is approved for sale?
- (a) 75% (c) 25%
(b) 76% (d) None of the previous
7. $\frac{3x-2}{x-2} + \frac{x+2}{2-x} =$
- (a) 2 (c) 1
(b) 0 (d) None of the previous

8. The greatest fraction in the set $\left\{\frac{5}{6}, \frac{6}{7}, \frac{5}{8}, \frac{6}{11}\right\}$ is:
- (a) $\frac{6}{7}$ (c) $\frac{5}{8}$
 (b) $\frac{5}{6}$ (d) $\frac{6}{11}$
9. The diameter of Circle X is exactly equal to the radius of Circle Y. If the sum of the areas of the two circles is exactly $80\pi \text{ cm}^2$, what is the radius of Circle X?
- (a) 4 cm (c) 8 cm
 (b) 2 cm (d) None of the previous
10. If $f(x) = 2x^2 - x$, what is the expression for $\frac{f(x+h) - f(x)}{h}$?
- (a) $4x + 2h - 1$ (c) $4x + h - 1$
 (b) $4x - 1$ (d) None of the previous
11. A delivery truck travels at a constant speed of v km/h for a 400 km trip. If the speed were reduced by 20 km/h, the trip would take 1 hour longer. Which of the following equations can be used to find v ?
- (a) $\frac{400}{v} - \frac{400}{v-20} = 1$ (c) $\frac{400}{v} + 1 = \frac{400}{v+20}$
 (b) $\frac{400}{v-20} + \frac{400}{v} = 1$ (d) None of the previous
12. $(x^2 - 2 + y)(x^2 - 2 - y) =$
- (a) $x^4 + 4 - y^2$ (c) $x^4 + 4x^2 + 4 - y^2$
 (b) $x^4 - 4x^2 + 4 - y^2$ (d) None of the previous
13. What is the solution set of the inequality $\left|\frac{3}{x-1}\right| \geq 1$?
- (a) $[-2, 4]$ (c) $[1, 4]$
 (b) $[-2, 1) \cup (1, 4]$ (d) $(-\infty, -2] \cup [4, \infty)$
14. Which of the following compound statements is False?
- (a) If $\sqrt{36} = 6$, then $3^{-1} = -3$. (c) $(-1)^4 = -1$ or $|-2| = 2$.
 (b) If a square has 5 sides, then 10 is a prime number. (d) $5 > 3$ and $2^3 = 8$.
15. $\frac{4\sqrt{18} - \sqrt{50}}{2\sqrt{8}} =$
- (a) -1 (c) $\frac{7}{4}$
 (b) -2 (d) $\frac{7}{2}$

16. A barrel contains 16 liters of oil, consisting of 25% olive oil and the rest is corn oil. How many liters of pure corn oil should be added to the barrel so that the proportion of olive oil becomes 10%?
- (a) 24 liters (c) 40 liters
(b) 10 liters (d) None of the previous
17. What is the solution set of the inequality $\frac{x^2 - x - 6}{x - 3} \leq 5$?
- (a) $(-\infty, 3)$ (c) $[-2, 3)$
(b) $(-\infty, 3]$ (d) None of the previous
18. Let x_1 and x_2 be the roots of the equation $x^2 - 7x + 12 = 0$. What is the value of $(x_1 + 1)(x_2 + 1)$?
- (a) 20 (c) 13
(b) 19 (d) None of the previous
19. A worker stacks boxes in piles of 9, 15, or 18, and in every case, exactly 5 boxes are left over. What is the minimum possible total number of boxes?
- (a) 95 (c) 85
(b) 90 (d) None of the previous
20. $x - 17\sqrt{x} + 16 =$
- (a) $(\sqrt{x} + 16)(\sqrt{x} + 1)$ (c) $(x - 16)(x - 1)$
(b) $(\sqrt{x} - 16)(\sqrt{x} - 1)$ (d) None of the previous



Answer Sheet

Mathematics · Mock Exam 4

Use a pencil. Fill the circle completely.

Correct



Wrong



Q's# Answers

1 – (A) (B) (C) (D)

2 – (A) (B) (C) (D)

3 – (A) (B) (C) (D)

4 – (A) (B) (C) (D)

5 – (A) (B) (C) (D)

Q's# Answers

6 – (A) (B) (C) (D)

7 – (A) (B) (C) (D)

8 – (A) (B) (C) (D)

9 – (A) (B) (C) (D)

10 – (A) (B) (C) (D)

Q's# Answers

11 – (A) (B) (C) (D)

12 – (A) (B) (C) (D)

13 – (A) (B) (C) (D)

14 – (A) (B) (C) (D)

15 – (A) (B) (C) (D)

Q's# Answers

16 – (A) (B) (C) (D)

17 – (A) (B) (C) (D)

18 – (A) (B) (C) (D)

19 – (A) (B) (C) (D)

20 – (A) (B) (C) (D)

STOP

Do not turn to the next page

The answer key is next. Keep it hidden until you have finished the whole exam.



Answer Key Mathematics · Mock Exam 4 · correct answers shaded

Q's#	Answers	Q's#	Answers	Q's#	Answers	Q's#	Answers
1 –	A B C D	6 –	A B C D	11 –	A B C D	16 –	A B C D
2 –	A B C D	7 –	A B C D	12 –	A B C D	17 –	A B C D
3 –	A B C D	8 –	A B C D	13 –	A B C D	18 –	A B C D
4 –	A B C D	9 –	A B C D	14 –	A B C D	19 –	A B C D
5 –	A B C D	10 –	A B C D	15 –	A B C D	20 –	A B C D

Learn from your mistakes

1 Go through your wrong answers one by one.



2 For each one, work out why you made the mistake.



3 Still stuck? Ask an AI to solve it and show you where it went wrong.



4 Write every mistake on a separate sheet, and review it before the next exam.





MATHEMATICS APTITUDE

Mock Exam 5



The exam is exactly 60:00 minutes



Wear a wrist watch



Sit in a quiet room



White paper and pencils only



Darken the circles correctly



Respect the rules. Never look at the key before you finish

1. What is the logical negation of the statement: "Kuwait is an Asian country and 12 is a multiple of 5"?
- (a) Kuwait is not an Asian country or 12 is not a multiple of 5
 (b) Kuwait is not an Asian country and 12 is not a multiple of 5
 (c) Kuwait is not an Asian country or 12 is a multiple of 5
 (d) Kuwait is an Asian country or 12 is not a multiple of 5
2. $\frac{x-1}{\sqrt{x}+1} - \sqrt{x} =$
- (a) 1
 (b) $\sqrt{x} - 1$
 (c) $x - 1$
 (d) None of the previous
3. If $\frac{2}{x-3} + \frac{3}{x-2} = \frac{7}{3-x}$ then $x =$
- (a) $\frac{9}{4}$
 (b) $\frac{4}{3}$
 (c) $\frac{3}{2}$
 (d) -2
4. A juice company wants to mix 15 liters of a 40% cherry juice drink with a 10% cherry juice drink to create a new drink that is exactly 20% cherry juice. How many liters of the 10% cherry juice drink must they add?
- (a) 30 liters
 (b) 20 liters
 (c) 45 liters
 (d) 15 liters
5. The solution set for the inequality $(x^2 - 1)(x^2 - 9) < 0$ is:
- (a) $(-1, 1)$
 (b) $(-3, 3)$
 (c) $(-3, 3) \setminus [\pm 1]$
 (d) None of the previous
6. A 50 KD shirt is discounted by a certain percentage. If the new price of the shirt is 42.5 KD, what is the percentage of the discount?
- (a) 15%
 (b) 85%
 (c) 17.6%
 (d) None of the previous
7. If $x < -2$, then $\frac{1}{\sqrt[3]{x}} \times (2x - 1) \times (\sqrt[3]{x} + 1) =$
- (a) $2x + 2x^{4/3} + x^{-1/3} + 1$
 (b) $2x + 2x^{4/3} + x^{1/3} + 1$
 (c) $2x + 2x^{2/3} + x^{1/3} + 1$
 (d) $2x + 2x^{2/3} - x^{-1/3} - 1$
8. If $f(x - 3) = x^2 - 6x + 8$, what is the expression for $f(x)$?
- (a) $x^2 - 1$
 (b) $x^2 - x$
 (c) $x^2 - 3x + 2$
 (d) $x^2 + 8$

9. A water tank is $\frac{7}{8}$ full. First, a valve drains $\frac{1}{7}$ of the water currently in the tank. Then, 15 more liters are removed manually. If the tank is now exactly half-full, what is the total capacity of the tank in liters?
- (a) 60 (c) 120
(b) 40 (d) 80
10. The solution set of the equation $|\sqrt{x} - 4| = 1$ is:
- (a) {25} (c) {9, 25}
(b) {9} (d) {3, 5}
11. The sum of five consecutive odd integers is 85. What is the ratio of the smallest integer to the largest integer in this set?
- (a) $\frac{13}{21}$ (c) $\frac{3}{5}$
(b) $\frac{15}{23}$ (d) None of the previous
12. The domain of $f(x) = \frac{1}{\sqrt{5-x}}$ is:
- (a) $(-\infty, 5]$ (c) $[5, \infty)$
(b) $(5, \infty)$ (d) None of the previous
13. $\left[8^{-1} \times \left(\frac{1}{4}\right)^{-\frac{3}{2}}\right]^{-2} =$
- (a) $\frac{1}{4}$ (c) 1
(b) 512 (d) $\frac{1}{64}$
14. A right-angled triangle has a base of x cm, a height of y cm, and a hypotenuse of z cm. If $x + y = 14$ and the area of the triangle is 24 cm^2 , what is the exact length of the hypotenuse z ?
- (a) 10 cm (c) 24 cm
(b) 14 cm (d) None of the previous
15. If x_1 and x_2 are the solutions to the equation $x^2 - 5x + 3 = 0$, find the value of $\frac{x_1}{x_2} + \frac{x_2}{x_1}$:
- (a) $\frac{19}{3}$ (c) 7
(b) $\frac{25}{3}$ (d) None of the previous

16. The intensity of light I from a source is inversely proportional to the square of the distance d from the source. If the intensity is I_0 at a distance of d , what is the intensity at a distance of $3d$?

(a) $\frac{1}{9}I_0$

(c) $9I_0$

(b) $\frac{1}{3}I_0$

(d) None of the previous

17. $\frac{7}{10} - \frac{1}{2} \div \frac{1}{4} \times \frac{1}{5} =$

(a) 1

(c) $\frac{11}{10}$

(b) $-\frac{93}{10}$

(d) $\frac{3}{10}$

18. Which of the following represents the solution set for $\frac{x}{x-1} + \frac{x}{x+1} < 2$?

(a) $(-1, 1)$

(c) $(-\infty, -1) \cup (1, \infty)$

(b) $\mathbb{R} \setminus \{\pm 1\}$

(d) $(1, \infty)$

19. Runner A completes a race in t minutes. Runner B completes the same race in $t + 10$ minutes. If Runner A runs exactly 1.5 times as fast as Runner B, which of the following equations can be used to find t ?

(a) $\frac{1}{t+10} = 1.5 \cdot \frac{1}{t}$

(c) $1.5t = t + 10$

(b) $t = 1.5(t + 10)$

(d) None of the previous

20. $5x^2 - 13xy + 6y^2 =$

(a) $(5x - 6y)(x - y)$

(c) $(5x - 2y)(x + 3y)$

(b) $(5x + 3y)(x + 2y)$

(d) None of the previous



Answer Sheet

Mathematics · Mock Exam 5

Use a pencil. Fill the circle completely.

Correct



Wrong



Q's# Answers

1 – (A) (B) (C) (D)

2 – (A) (B) (C) (D)

3 – (A) (B) (C) (D)

4 – (A) (B) (C) (D)

5 – (A) (B) (C) (D)

Q's# Answers

6 – (A) (B) (C) (D)

7 – (A) (B) (C) (D)

8 – (A) (B) (C) (D)

9 – (A) (B) (C) (D)

10 – (A) (B) (C) (D)

Q's# Answers

11 – (A) (B) (C) (D)

12 – (A) (B) (C) (D)

13 – (A) (B) (C) (D)

14 – (A) (B) (C) (D)

15 – (A) (B) (C) (D)

Q's# Answers

16 – (A) (B) (C) (D)

17 – (A) (B) (C) (D)

18 – (A) (B) (C) (D)

19 – (A) (B) (C) (D)

20 – (A) (B) (C) (D)

STOP

Do not turn to the next page

The answer key is next. Keep it hidden until you have finished the whole exam.



Answer Key Mathematics · Mock Exam 5 · correct answers shaded

Q's#	Answers	Q's#	Answers	Q's#	Answers	Q's#	Answers
1 –	A B C D	6 –	A B C D	11 –	A B C D	16 –	A B C D
2 –	A B C D	7 –	A B C D	12 –	A B C D	17 –	A B C D
3 –	A B C D	8 –	A B C D	13 –	A B C D	18 –	A B C D
4 –	A B C D	9 –	A B C D	14 –	A B C D	19 –	A B C D
5 –	A B C D	10 –	A B C D	15 –	A B C D	20 –	A B C D

Learn from your mistakes

1 Go through your wrong answers one by one.



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MATHEMATICS APTITUDE

Mock Exam 6



The exam is exactly 60:00 minutes



Wear a wrist watch



Sit in a quiet room



White paper and pencils only



Darken the circles correctly



Respect the rules. Never look at the key before you finish

1. What is the logical negation of the statement: "Maryam writes the book or $x > 5$ "?
- (a) Maryam does not write the book and $x \leq 5$ (c) Maryam does not write the book and $x < 5$
 (b) Maryam does not write the book or $x \leq 5$ (d) Maryam writes the book and $x \leq 5$
2. Which of the following represents the solution set for $(x^2 - 4)^2 > 0$?
- (a) $\mathbb{R} \setminus \{\pm 2\}$ (c) $\mathbb{R}$
 (b) $(2, \infty)$ (d) ϕ
3. $|-8| - \frac{\sqrt{(-6)^2}}{\sqrt[5]{-32}} =$
- (a) 5 (c) 11
 (b) -5 (d) None of the previous
4. A number that is increased by 150% becomes 750. This number is:
- (a) 500 (c) 250
 (b) 1125 (d) None of the previous
5. The solution set for the equation $9^x - 10(3^x) + 9 = 0$ is:
- (a) $\{0, 2\}$ (c) $\{2\}$
 (b) $\{1, 9\}$ (d) $\{0, 1\}$
6. Which interval represents the set of all real values of x that satisfy the inequality $\frac{2x - 3}{2} < \frac{3x + 1}{4}$?
- (a) $(-\infty, 7)$ (c) $(-\infty, -7)$
 (b) $(7, \infty)$ (d) $(-\infty, 5)$
7. A heating system consumes a full tank of fuel in exactly 8 hours when set to a temperature of T degrees. If the temperature is increased by 4 degrees, the fuel tank empties in exactly 6 hours. What is the original temperature T ?
- (a) 12 (c) 32
 (b) 24 (d) None of the previous
8. The domain of $f(x) = \frac{\sqrt{x-5}}{\sqrt{x+2}}$ is:
- (a) $[5, \infty)$ (c) $(-2, 5]$
 (b) $(-\infty, -2) \cup [5, \infty)$ (d) None of the previous

9. Which of the following inequalities is satisfied by all real values of x ?
- (a) $|x| + 5 > 0$ (c) $|x| > x$
(b) $|x| > 0$ (d) None of the previous
10. Laila is 6 years older than Sara. Mariam's age is exactly twice the sum of Laila and Sara's ages. If the sum of all three ages is 54, what is Sara's age?
- (a) 6 (c) 4
(b) 12 (d) None of the previous
11. $\frac{x^3 - 1}{x - 1} =$
- (a) $x^2 - x + 1$ (c) $x^2 + x + 1$
(b) $x^2 - 1$ (d) $x^2 + 1$
12. $4a^2 - 12ab + 9b^2 - 25c^2 =$
- (a) $(2a + 3b - 5c)(2a + 3b + 5c)$ (c) $(2a - 3b - 5c)^2$
(b) $(2a - 3b - 25c^2)(2a - 3b + 25c^2)$ (d) None of the previous
13. A 40 ml bottle of essential oil blend contains 10% lavender oil. How many ml of a 40% lavender oil blend must be added so that the final mixture has a ratio of 1 : 3 lavender oil to other oils?
- (a) 40 ml (c) 133.3 ml
(b) 25 ml (d) None of the previous
14. $\frac{1}{k^2 - k} - \frac{1}{k^2 + k} - \frac{2}{k^3 - k} =$
- (a) 0 (c) $\frac{2}{k^2 - 1}$
(b) $\frac{2}{k}$ (d) None of the previous
15. Let f be a function such that $f(-x) = -f(x)$ for every real x . What is the value of $f(0) \cdot f(5)$?
- (a) 0 (c) -1
(b) 1 (d) None of the previous
16. The radius of a right circular cylinder is increased by 50%, but its height is decreased by 20%. By what percentage does the total volume of the cylinder change?
- (a) Increases by 80% (c) Increases by 20%
(b) Increases by 30% (d) None of the previous

17. Solve the equation $\frac{x^4 - 16}{(x - 2)(x^2 + 4)} = 8$ for the set of all real roots:
- (a) $\{6\}$ (c) $\{\pm 2\}$
(b) $\{2, 6\}$ (d) None of the previous
18. $k(x + a) = m(x - b) \implies x =$
- (a) $\frac{ka+mb}{m-k}$ (c) $\frac{ka+mb}{m+k}$
(b) $\frac{ka-mb}{m-k}$ (d) None of the previous
19. A cyclist plans to arrive at a destination at exactly 12:00 PM. If they ride at 15 km/h, they will arrive 1 hour early. If they ride at 10 km/h, they will arrive 1 hour late. What constant speed must they ride to arrive at exactly 12:00 PM?
- (a) 12.5 km/h (c) 25 km/h
(b) 10.5 km/h (d) None of the previous
20. $\frac{2 - \frac{1}{3}}{1 + \frac{2}{3}} =$
- (a) 1 (c) $\frac{5}{3}$
(b) $\frac{9}{25}$ (d) $\frac{1}{3}$



Answer Sheet

Mathematics · Mock Exam 6

Use a pencil. Fill the circle completely.

Correct



Wrong



Q's# Answers

1 – (A) (B) (C) (D)

2 – (A) (B) (C) (D)

3 – (A) (B) (C) (D)

4 – (A) (B) (C) (D)

5 – (A) (B) (C) (D)

Q's# Answers

6 – (A) (B) (C) (D)

7 – (A) (B) (C) (D)

8 – (A) (B) (C) (D)

9 – (A) (B) (C) (D)

10 – (A) (B) (C) (D)

Q's# Answers

11 – (A) (B) (C) (D)

12 – (A) (B) (C) (D)

13 – (A) (B) (C) (D)

14 – (A) (B) (C) (D)

15 – (A) (B) (C) (D)

Q's# Answers

16 – (A) (B) (C) (D)

17 – (A) (B) (C) (D)

18 – (A) (B) (C) (D)

19 – (A) (B) (C) (D)

20 – (A) (B) (C) (D)

STOP

Do not turn to the next page

The answer key is next. Keep it hidden until you have finished the whole exam.



Answer Key Mathematics · Mock Exam 6 · correct answers shaded

Q's#	Answers	Q's#	Answers	Q's#	Answers	Q's#	Answers
1 –	☒ A ☐ B ☐ C ☐ D	6 –	☒ A ☐ B ☐ C ☐ D	11 –	☐ A ☐ B ☒ C ☐ D	16 –	☒ A ☐ B ☐ C ☐ D
2 –	☒ A ☐ B ☐ C ☐ D	7 –	☒ A ☐ B ☐ C ☐ D	12 –	☐ A ☐ B ☐ C ☒ D	17 –	☒ A ☐ B ☐ C ☐ D
3 –	☐ A ☐ B ☒ C ☐ D	8 –	☒ A ☐ B ☐ C ☐ D	13 –	☒ A ☐ B ☐ C ☐ D	18 –	☒ A ☐ B ☐ C ☐ D
4 –	☐ A ☐ B ☐ C ☒ D	9 –	☒ A ☐ B ☐ C ☐ D	14 –	☒ A ☐ B ☐ C ☐ D	19 –	☐ A ☐ B ☐ C ☒ D
5 –	☒ A ☐ B ☐ C ☐ D	10 –	☒ A ☐ B ☐ C ☐ D	15 –	☒ A ☐ B ☐ C ☐ D	20 –	☒ A ☐ B ☐ C ☐ D

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MATHEMATICS APTITUDE

Mock Exam 7



The exam is exactly 60:00 minutes



Wear a wrist watch



Sit in a quiet room



White paper and pencils only



Darken the circles correctly



Respect the rules. Never look at the key before you finish

1. A store applies two sequential discounts to a product. The first discount is 10%, and the second discount is $y\%$. If the total equivalent single discount is 28%, what is the value of y ?
- (a) 20 (c) 38
(b) 18 (d) None of the previous
2. What is the set of all real solutions for the equation $\frac{(x+1)^2 - 4}{x+3} = x - 1$?
- (a) $\{1, -3\}$ (c) $\mathbb{R}$
(b) $\{-3\}$ (d) None of the previous
3. Find the solution set of the inequality $x^3 - 3x^2 - x + 3 > 0$:
- (a) $(-1, 3)$ (c) $(-1, 1)$
(b) $(1, \infty)$ (d) None of the previous
4. A 40 ml container holds a liquid mixture that is 20% alcohol and 80% water. How many ml of pure water must be added to lower the alcohol concentration to 16%?
- (a) 10 ml (c) 50 ml
(b) 8 ml (d) None of the previous
5. What is the solution set of the equation $|x^2 - 16| \cdot |x - 4|^{-1} = 2$?
- (a) $\{-2, -6\}$ (c) $\{2, 6\}$
(b) $\{-2\}$ (d) $\{6\}$
6. $x(x-3)^2 - x^3 =$
- (a) $-6x^2 + 9x$ (c) $-3x^2 + 9x$
(b) $9x$ (d) $x^3 - 6x^2 + 9x$
7. What is the logical negation of the statement: "A square has 5 sides and $\sqrt{25} < 5$ "?
- (a) A square does not have 5 sides or $\sqrt{25} \geq 5$ (c) A square does not have 5 sides or $\sqrt{25} > 5$
(b) A square does not have 5 sides and $\sqrt{25} \geq 5$ (d) A square has 5 sides or $\sqrt{25} \geq 5$
8. $(x+y)^2 = 100$ and $(x-y)^2 = 36 \implies xy =$
- (a) 16 (c) 32
(b) 64 (d) 8

9. The solution set for the inequality $\frac{x-1}{x+1} \geq 0$ is:
- (a) $[-1, 1]$ (c) $(-1, 1]$
(b) $(-\infty, -1) \cup [1, \infty)$ (d) $(-\infty, -1) \cup (1, \infty)$
10. In a survey of university students, 75% own a laptop and 45% own a tablet. If every student owns at least one of the two devices, what percentage of students own only a laptop?
- (a) 55% (c) 120%
(b) 20% (d) None of the previous
11. $3a^2 - 10ab + 8b^2 =$
- (a) $(3a - 4b)(a - 2b)$ (c) $(3a - 2b)(a - 4b)$
(b) $(3a + 4b)(a + 2b)$ (d) $(3a - 8b)(a - b)$
12. Let x_1 and x_2 be the roots of the equation $x^2 - 10x + k = 0$. If the difference between the roots is $x_1 - x_2 = 4$, find the value of k :
- (a) 25 (c) 10
(b) 16 (d) None of the previous
13. The perimeter of a square is increased by 20%. What is the exact percentage increase in the total area of the square?
- (a) 44% (c) 40%
(b) 20% (d) None of the previous
14. $(2a^{-3}b^2)^3 \times (a^4b^{-5})^{-2} =$
- (a) $\frac{8b^{16}}{a^{17}}$ (c) $\frac{8}{b^2}$
(b) $\frac{2b^{16}}{a^{17}}$ (d) $\frac{8b^{16}}{a}$
15. $\frac{1}{\sqrt{x+1} + \sqrt{x}} + \sqrt{x} =$
- (a) $\sqrt{x+1}$ (c) $\sqrt{x} - 1$
(b) $2\sqrt{x}$ (d) 1
16. A cyclist rides 24 km against a steady headwind. The return trip with the same wind as a tailwind takes exactly 2 hours less. If the cyclist's speed in still air is 10 km/h, what is the speed of the wind?
- (a) 2 km/h (c) 5 km/h
(b) 4 km/h (d) None of the previous

17. The domain of $f(x) = \frac{1}{\sqrt{|x-3|-4}}$ is:
- (a) $(-1, 7)$ (c) $(-\infty, -1] \cup [7, \infty)$
(b) $[-1, 7]$ (d) None of the previous
18. Let $f(x) = kx - 2$ and $g(x) = x + k$. If $f(g(1)) = 4$, find the positive value of k :
- (a) 2 (c) 6
(b) 3 (d) None of the previous
19. A landscaping company charges by the area of the lawn mowed. They charge 40 KD to mow a square lawn with a side length of 10 meters. How much will they charge to mow a square lawn with a side length of 15 meters, assuming the rate per square meter remains constant?
- (a) 60 KD (c) 26.6 KD
(b) 45 KD (d) None of the previous
20. What is the solution set of the inequality $x^2 - 4x < 5$?
- (a) $(-1, 5)$ (c) $[-1, 5]$
(b) $(-\infty, -1) \cup (5, \infty)$ (d) None of the previous



Answer Sheet

Mathematics · Mock Exam 7

Use a pencil. Fill the circle completely.

Correct



Wrong



Q's# Answers

1 – (A) (B) (C) (D)

2 – (A) (B) (C) (D)

3 – (A) (B) (C) (D)

4 – (A) (B) (C) (D)

5 – (A) (B) (C) (D)

Q's# Answers

6 – (A) (B) (C) (D)

7 – (A) (B) (C) (D)

8 – (A) (B) (C) (D)

9 – (A) (B) (C) (D)

10 – (A) (B) (C) (D)

Q's# Answers

11 – (A) (B) (C) (D)

12 – (A) (B) (C) (D)

13 – (A) (B) (C) (D)

14 – (A) (B) (C) (D)

15 – (A) (B) (C) (D)

Q's# Answers

16 – (A) (B) (C) (D)

17 – (A) (B) (C) (D)

18 – (A) (B) (C) (D)

19 – (A) (B) (C) (D)

20 – (A) (B) (C) (D)

STOP

Do not turn to the next page

The answer key is next. Keep it hidden until you have finished the whole exam.



Answer Key Mathematics · Mock Exam 7 · correct answers shaded

Q's#	Answers	Q's#	Answers	Q's#	Answers	Q's#	Answers
1 –	A B C D	6 –	A B C D	11 –	A B C D	16 –	A B C D
2 –	A B C D	7 –	A B C D	12 –	A B C D	17 –	A B C D
3 –	A B C D	8 –	A B C D	13 –	A B C D	18 –	A B C D
4 –	A B C D	9 –	A B C D	14 –	A B C D	19 –	A B C D
5 –	A B C D	10 –	A B C D	15 –	A B C D	20 –	A B C D

Learn from your mistakes

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2 For each one, work out why you made the mistake.



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MATHEMATICS APTITUDE

Mock Exam 8



The exam is exactly 60:00 minutes



Wear a wrist watch



Sit in a quiet room



White paper and pencils only



Darken the circles correctly



Respect the rules. Never look at the key before you finish

1. Two baskets, X and Y, contain balls in the ratio 9 : 4. If basket X contains 20 more balls than basket Y, how many balls must be moved from basket X to basket Y so that both baskets contain the same number of balls?
- (a) 10 (c) 13
(b) 20 (d) None of the previous
2. $3x^3 + 2x^2 - 12x - 8 =$
- (a) $(x^2 - 4)(3x - 2)$ (c) $(x - 2)^2(3x + 2)$
(b) $(x - 2)(x + 2)(3x + 2)$ (d) None of the previous
3. If $Ax + B = C(x - A)$, then x equals:
- (a) $\frac{B - AC}{C - A}$ (c) $\frac{AC + B}{C - A}$
(b) $\frac{AC - B}{C - A}$ (d) $\frac{A - BC}{C - A}$
4. A store discounts a jacket by 10% at the start of the month, then takes an additional 20% off the sale price. Finally, they apply a 25% employee discount to the new price. If the final price paid is 54 KD, what was the original price of the jacket?
- (a) 100 KD (c) 84 KD
(b) 120 KD (d) None of the previous
5. What is the solution set of the inequality $\frac{x^2}{2} - x \geq \frac{3}{2}$?
- (a) $(-\infty, -1] \cup [3, \infty)$ (c) $(-\infty, -1) \cup (3, \infty)$
(b) $[-1, 3]$ (d) None of the previous
6. $x, y > 0, \sqrt[4]{81x^{12}y^{-8}} \div (x^{-1}y^2)^{-2} =$
- (a) $81xy^2$ (c) $3xy^2$
(b) $3x^{10}y^{-4}$ (d) None of the previous
7. Revised Question 1: A 104 kg block of bronze alloy is made of copper and tin in a ratio of 9 : 4. How much pure tin must be added so the amount of tin becomes exactly $\frac{1}{2}$ of the amount of copper?
- (a) 4 kg (c) 6 kg
(b) 8 kg (d) None of the previous

8. $\frac{1.2 - \frac{1}{5}}{\frac{1}{2} \div 0.25} =$
- (a) 8 (c) $\frac{1}{2}$
 (b) 2 (d) $\frac{4}{5}$
9. Which interval satisfies both inequalities $x^2 - x - 6 \leq 0$ and $x > 0$?
- (a) $[-2, 3]$ (c) $(0, 3)$
 (b) $(0, 3]$ (d) None of the previous
10. Walker A leaves camp at 4 km/h. One hour later, Walker B leaves camp along the exact same path at 6 km/h. When Walker B has been walking for 2.5 hours, what is the distance between Walker A and Walker B?
- (a) 2 km (c) 15 km
 (b) 5 km (d) None of the previous
11. $\frac{8x^3 + 27}{2x + 3} =$
- (a) $4x^2 + 6x + 9$ (c) $4x^2 - 12x + 9$
 (b) $4x^2 - 6x + 9$ (d) None of the previous
12. The solution set of the equation $(x + 3)^2 + (x - 3)^2 = 20$ is:
- (a) $\{1\}$ (c) $\{0\}$
 (b) $\{\pm 3\}$ (d) None of the previous
13. The radius of Cylinder A is exactly 5 times the radius of Cylinder B. The height of Cylinder A is exactly 4 times the height of Cylinder B. How many completely full Cylinder B's are needed to exactly fill one empty Cylinder A?
- (a) 20 (c) 80
 (b) 125 (d) None of the previous
14. If $x > 0$ and $y < 0$, then $\frac{x - y}{\sqrt{x - y}} =$
- (a) $\sqrt{x} - \sqrt{y}$ (c) $\frac{x - y}{\sqrt{x} - \sqrt{y}}$
 (b) $\sqrt{x + y}$ (d) None of the previous
15. Let $f(x) = \frac{x + 1}{x - 1}$ and $g(x) = \frac{x - 1}{x + 1}$. Which of the following represents $f(g(x))$?
- (a) $-x$ (c) $\frac{-2x}{x + 1}$
 (b) $\frac{4x}{x^2 - 1}$ (d) None of the previous

16. Which of the following compound statements is True?

- (a) If $(-2)^2 = -4$ or 0 is a positive number, then $3^{-1} = -3$.
(b) If 5 is an odd number and 2 is a prime number, then $\sqrt{25} = -5$.
(c) $3^2 = 9$ or $|-4| = -4$ if and only if $\frac{1}{2} > 1$.
(d) If $2^3 = 8$ or $4^0 = 0$, then $5 < 3$.

17. Find the sum of all roots for the equation $(2x - 1)^2 - 5(2x - 1) + 6 = 0$:

- (a) 5
(b) 3
(c) 1
(d) None of the previous

18. The domain of $f(x) = \sqrt{\frac{x-2}{(x-2)^2+4}}$ is:

- (a) $[2, \infty)$
(b) $(2, \infty)$
(c) $\mathbb{R} \setminus \{2\}$
(d) None of the previous

19. A water pump fills a pool with V liters of water in h hours. Assuming the pump operates at a constant rate, how many liters of water will it pump in m minutes?

- (a) $\frac{60hm}{V}$
(b) $\frac{60Vm}{h}$
(c) $\frac{hm}{60V}$
(d) None of the previous

20. What is the solution set of the inequality $\sqrt{x^2 + 6x + 9} \leq 0$?

- (a) $(-\infty, -3]$
(b) $\{-3\}$
(c) ϕ
(d) None of the previous



Answer Sheet

Mathematics · Mock Exam 8

Use a pencil. Fill the circle completely.

Correct



Wrong



Q's# Answers

1 – (A) (B) (C) (D)

2 – (A) (B) (C) (D)

3 – (A) (B) (C) (D)

4 – (A) (B) (C) (D)

5 – (A) (B) (C) (D)

Q's# Answers

6 – (A) (B) (C) (D)

7 – (A) (B) (C) (D)

8 – (A) (B) (C) (D)

9 – (A) (B) (C) (D)

10 – (A) (B) (C) (D)

Q's# Answers

11 – (A) (B) (C) (D)

12 – (A) (B) (C) (D)

13 – (A) (B) (C) (D)

14 – (A) (B) (C) (D)

15 – (A) (B) (C) (D)

Q's# Answers

16 – (A) (B) (C) (D)

17 – (A) (B) (C) (D)

18 – (A) (B) (C) (D)

19 – (A) (B) (C) (D)

20 – (A) (B) (C) (D)

STOP

Do not turn to the next page

The answer key is next. Keep it hidden until you have finished the whole exam.



Answer Key Mathematics · Mock Exam 8 · correct answers shaded

Q's#	Answers	Q's#	Answers	Q's#	Answers	Q's#	Answers
1 –	A B C D	6 –	A B C D	11 –	A B C D	16 –	A B C D
2 –	A B C D	7 –	A B C D	12 –	A B C D	17 –	A B C D
3 –	A B C D	8 –	A B C D	13 –	A B C D	18 –	A B C D
4 –	A B C D	9 –	A B C D	14 –	A B C D	19 –	A B C D
5 –	A B C D	10 –	A B C D	15 –	A B C D	20 –	A B C D

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MATHEMATICS APTITUDE

Mock Exam 9



The exam is exactly 60:00 minutes



Wear a wrist watch



Sit in a quiet room



White paper and pencils only



Darken the circles correctly



Respect the rules. Never look at the key before you finish

1. If 40% of a number is added to 50, the result is exactly 90% of the number. What is the number?
- (a) 100 (c) 38.4
(b) 50 (d) 80
2. Let $f(x) = x^2 - 4x$ and $g(x) = x + 2$. Find the product of all values of x for which $f(g(x)) = -3$:
- (a) 1 (c) -4
(b) -3 (d) None of the previous
3. The solution set of the equation $\frac{|x-5|}{5-x} + x = 0$ is:
- (a) $\{-1\}$ (c) $\{1\}$
(b) $\{1, -1\}$ (d) $\{5\}$
4. A high-speed train travels at a constant speed of 108 kilometers per hour. What is the speed of the train in meters per second?
- (a) 30 m/s (c) 388.8 m/s
(b) 300 m/s (d) None of the previous
5. The solution set of the inequality $(x-2)^2 \geq (x+2)^2 - 8x$ is:
- (a) $\mathbb{R}$ (c) $\{0\}$
(b) ϕ (d) $\{2, -2\}$
6. The domain of $f(x) = \sqrt{\frac{x}{x-2}} - 1$ is:
- (a) $(2, \infty)$ (c) $\mathbb{R} \setminus \{2\}$
(b) $(-\infty, 2)$ (d) $[2, \infty)$
7. A painter has a bucket of paint. He uses $\frac{1}{3}$ of the paint for the first wall. He then accidentally adds water to the remaining paint, which increases its volume by 20%. If the final volume in the bucket is 24 liters, what was the initial volume of pure paint?
- (a) 30 liters (c) 36 liters
(b) 20 liters (d) 25 liters
8. $\frac{2}{x^2 - 3x} - \frac{1}{x} =$
- (a) $\frac{-x-1}{x^2-3x}$ (c) $\frac{x+5}{x^2-3x}$
(b) $\frac{5-x}{x^2-3x}$ (d) None of the previous

9. $x + 2y + 3z = 10$ and $3x + 2y + z = 14 \implies x + y + z =$
- (a) 24 (c) 4
(b) 12 (d) None of the previous
10. The distance d a ball rolls down an inclined plane is directly proportional to the square of the time t it rolls. If the ball rolls 12 meters in 2 seconds, how many meters will it roll in 5 seconds?
- (a) 75 (c) 150
(b) 30 (d) 60
11. If $x < -2$, then $\frac{x\sqrt{x^2 + 4x + 4}}{x^2 - 4}$ equals:
- (a) $\frac{x}{x - 2}$ (c) $\frac{x}{2 - x}$
(b) $\frac{x}{x + 2}$ (d) $\frac{-x}{x + 2}$
12. What is the solution set of the inequality $\frac{x^2 + 1}{x + 1} > 1$?
- (a) $(-1, 0) \cup (1, \infty)$ (c) $(-\infty, -1) \cup (0, 1)$
(b) $(1, \infty)$ (d) $\mathbb{R} \setminus \{-1\}$
13. A piece of wire is bent to form a perfect square with an area of 144 cm^2 . The exact same wire is unbent and reformed into a rectangle whose length is 3 times its width. What is the area of this new rectangle?
- (a) 108 cm^2 (c) 36 cm^2
(b) 48 cm^2 (d) None of the previous
14. $2 - \frac{3}{5} \div \frac{9}{10} + \frac{1}{3} =$
- (a) $\frac{17}{9}$ (c) $\frac{5}{3}$
(b) 1 (d) $\frac{1}{3}$
15. If -3 and 5 are solutions to $x^2 + px + q = 0$, find $p + q$:
- (a) -17 (c) 17
(b) -13 (d) None of the previous
16. A 120 ml mixture of juice and water has a ratio of $1 : 3$. How many ml of water must be evaporated so that the ratio of juice to water becomes $1 : 2$?
- (a) 40 ml (c) 60 ml
(b) 90 ml (d) None of the previous

17. The solution set for the equation $(x - 1) - 4\sqrt{x - 1} + 3 = 0$ is:

(a) $\{2, 10\}$

(c) $\{2, 4\}$

(b) $\{1, 3\}$

(d) None of the previous

18. $2^{40} + 4(2^{37}) - \frac{1}{2}(2^{42}) =$

(a) -2^{40}

(c) 2^{38}

(b) 7×2^{39}

(d) -2^{39}

19. A car travels the first half of a journey at a constant speed of x km/h and the second half at a constant speed of y km/h. If the average speed for the entire journey is 48 km/h and $x = 40$ km/h, what is the value of y ?

(a) 60 km/h

(c) 44 km/h

(b) 56 km/h

(d) None of the previous

20. $(2x + 5)^2 - (2x - 5)^2 =$

(a) 0

(c) $40x$

(b) 50

(d) $20x$



Answer Sheet

Mathematics · Mock Exam 9

Use a pencil. Fill the circle completely.

Correct 

Wrong   

Q's# Answers

1 – ☐ A ☐ B ☐ C ☐ D

2 – ☐ A ☐ B ☐ C ☐ D

3 – ☐ A ☐ B ☐ C ☐ D

4 – ☐ A ☐ B ☐ C ☐ D

5 – ☐ A ☐ B ☐ C ☐ D

Q's# Answers

6 – ☐ A ☐ B ☐ C ☐ D

7 – ☐ A ☐ B ☐ C ☐ D

8 – ☐ A ☐ B ☐ C ☐ D

9 – ☐ A ☐ B ☐ C ☐ D

10 – ☐ A ☐ B ☐ C ☐ D

Q's# Answers

11 – ☐ A ☐ B ☐ C ☐ D

12 – ☐ A ☐ B ☐ C ☐ D

13 – ☐ A ☐ B ☐ C ☐ D

14 – ☐ A ☐ B ☐ C ☐ D

15 – ☐ A ☐ B ☐ C ☐ D

Q's# Answers

16 – ☐ A ☐ B ☐ C ☐ D

17 – ☐ A ☐ B ☐ C ☐ D

18 – ☐ A ☐ B ☐ C ☐ D

19 – ☐ A ☐ B ☐ C ☐ D

20 – ☐ A ☐ B ☐ C ☐ D

STOP

Do not turn to the next page

The answer key is next. Keep it hidden until you have finished the whole exam.



Answer Key Mathematics · Mock Exam 9 · correct answers shaded

Q's#	Answers	Q's#	Answers	Q's#	Answers	Q's#	Answers
1 –	A B C D	6 –	A B C D	11 –	A B C D	16 –	A B C D
2 –	A B C D	7 –	A B C D	12 –	A B C D	17 –	A B C D
3 –	A B C D	8 –	A B C D	13 –	A B C D	18 –	A B C D
4 –	A B C D	9 –	A B C D	14 –	A B C D	19 –	A B C D
5 –	A B C D	10 –	A B C D	15 –	A B C D	20 –	A B C D

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MATHEMATICS APTITUDE

Mock Exam 10



The exam is exactly 60:00 minutes



Wear a wrist watch



Sit in a quiet room



White paper and pencils only



Darken the circles correctly



Respect the rules. Never look at the key before you finish

1. Let m be a positive number. If x is 30% of m , and y is 40% of x , which of the following expressions represents y in terms of m ?
- (a) $0.12m$ (c) $0.10m$
(b) $0.70m$ (d) None of the previous
2. $15x^3 - 10x^2 - 6x + 4 =$
- (a) $(5x^2 + 2)(3x - 2)$ (c) $(5x^2 - 2)(3x + 2)$
(b) $(5x^2 - 2)(3x - 2)$ (d) None of the previous
3. The solution set of the inequality $\frac{|x - 2|}{x - 2} \geq x - 4$ is:
- (a) $(-\infty, 2) \cup (2, 5]$ (c) $[2, 5]$
(b) $(-\infty, 5]$ (d) None of the previous
4. The weight W of a solid metal cylinder is directly proportional to both its height h and the square of its radius r . A cylinder with $r = 3$ cm and $h = 5$ cm weighs 90 g. What is the weight of a cylinder made of the same metal with $r = 4$ cm and $h = 10$ cm?
- (a) 320 g (c) 120 g
(b) 240 g (d) None of the previous
5. $\frac{x^4 - 81}{x - 3} =$
- (a) $x^3 + 3x^2 + 9x + 27$ (c) $x^3 + 27$
(b) $x^3 - 3x^2 + 9x - 27$ (d) None of the previous
6. The domain of $f(x) = \frac{\sqrt[3]{x}}{|x| + 1}$ is:
- (a) $[0, \infty)$ (c) $\mathbb{R}$
(b) $\mathbb{R} \setminus \{-1\}$ (d) $(-\infty, 0) \cup (0, \infty)$
7. A company wraps spherical chocolates entirely in gold foil. The total area of foil used to wrap exactly 3 identical chocolates is 108π cm². What is the exact volume of one of these chocolates?
- (a) 36π cm³ (c) 9π cm³
(b) 108π cm³ (d) None of the previous
8. If the equation $x^2 + (k - 3)x + k = 0$ has exactly one real solution, the possible values for k are:
- (a) $\{3, 9\}$ (c) $\{0, 1\}$
(b) $\{1, -9\}$ (d) None of the previous

9. $\frac{x^2 + 4}{x} - (x - 2) =$

(a) $\frac{2x+4}{x}$

(c) $\frac{4}{x}$

(b) $\frac{4-2x}{x}$

(d) None of the previous

10. A race car drives at a constant speed of 360 kilometers per hour. How many meters does the car travel in exactly 12 seconds?

(a) 1200 m

(c) 300 m

(b) 4320 m

(d) None of the previous

11. If $f(x) = x^2 + kx + 1 - k$ and $g(x) = x + 2$, find the value of k given that $f(g(1)) = 14$:

(a) -2

(c) $5/2$

(b) 4

(d) None of the previous

12. $\sqrt[3]{y\sqrt{y}} =$ where $y > 0$

(a) y

(c) $\sqrt{y}$

(b) $\sqrt[4]{y^3}$

(d) No Correct Answer

13. A factory uses 15 identical robots to assemble 900 engines in 4 hours. To assemble 1800 engines in 6 hours, how many total robots are required?

(a) 5

(c) 30

(b) 15

(d) None of the previous

14. If a and c are real numbers such that $ac < 0$, which of the following is correct for the equation $ax^2 + bx + c = 0$?

(a) Has two real solutions

(c) Has a negative root

(b) Depends on the sign of b

(d) No real roots if $b = 0$

15. $\frac{3}{\frac{1}{4} - \frac{5}{6}} =$

(a) $-\frac{3}{7}$

(c) $-\frac{4}{9}$

(b) $-\frac{7}{36}$

(d) $-\frac{36}{7}$

16. A 30 kg mixture of sand, gravel, and cement has a ratio of 3 : 2 : 1. If a worker wants to increase the percentage of cement in the total mixture to 25%, how many kg of pure cement must be added?

(a) $10/3$ kg

(c) 2.5 kg

(b) 7.5 kg

(d) None of the previous

17. The solution set of the inequality $\frac{x-1}{x} \leq \frac{x}{x-1}$ is:
- (a) $(0, 1)$ (c) $[1/2, \infty) \setminus \{1\}$
(b) $(-\infty, 0) \cup [1/2, 1)$ (d) None of the previous
18. $\frac{2x-1}{3} - \frac{x+k}{4} = x \implies x=0 \implies k =$
- (a) $-4/3$ (c) $1/4$
(b) $4/3$ (d) None of the previous
19. A power plant charges a fixed monthly maintenance fee of F KD. The first 200 units of electricity are included in this fee. Every additional $1/2$ unit of electricity costs c KD. Which expression represents the total monthly bill B for a consumption of U units?
- (a) $F + 0.5c(U - 200)$ (c) $F + 2c(U + 200)$
(b) $F + c(U - 200)$ (d) None of the previous
20. Find the solution set of the inequality $x(x-2)^2 \leq 0$:
- (a) $(-\infty, 0]$ (c) $(-\infty, 0) \cup \{2\}$
(b) $(-\infty, 2]$ (d) None of the previous



Answer Sheet Mathematics · Mock Exam 10

Use a pencil. Fill the circle completely. Correct  Wrong   

Q's#	Answers	Q's#	Answers	Q's#	Answers	Q's#	Answers
1 –	☐ A ☐ B ☐ C ☐ D	6 –	☐ A ☐ B ☐ C ☐ D	11 –	☐ A ☐ B ☐ C ☐ D	16 –	☐ A ☐ B ☐ C ☐ D
2 –	☐ A ☐ B ☐ C ☐ D	7 –	☐ A ☐ B ☐ C ☐ D	12 –	☐ A ☐ B ☐ C ☐ D	17 –	☐ A ☐ B ☐ C ☐ D
3 –	☐ A ☐ B ☐ C ☐ D	8 –	☐ A ☐ B ☐ C ☐ D	13 –	☐ A ☐ B ☐ C ☐ D	18 –	☐ A ☐ B ☐ C ☐ D
4 –	☐ A ☐ B ☐ C ☐ D	9 –	☐ A ☐ B ☐ C ☐ D	14 –	☐ A ☐ B ☐ C ☐ D	19 –	☐ A ☐ B ☐ C ☐ D
5 –	☐ A ☐ B ☐ C ☐ D	10 –	☐ A ☐ B ☐ C ☐ D	15 –	☐ A ☐ B ☐ C ☐ D	20 –	☐ A ☐ B ☐ C ☐ D

STOP

Do not turn to the next page

The answer key is next. Keep it hidden until you have finished the whole exam.



Answer Key Mathematics · Mock Exam 10 · correct answers shaded

Q's#	Answers	Q's#	Answers	Q's#	Answers	Q's#	Answers
1 –	A B C D	6 –	A B C D	11 –	A B C D	16 –	A B C D
2 –	A B C D	7 –	A B C D	12 –	A B C D	17 –	A B C D
3 –	A B C D	8 –	A B C D	13 –	A B C D	18 –	A B C D
4 –	A B C D	9 –	A B C D	14 –	A B C D	19 –	A B C D
5 –	A B C D	10 –	A B C D	15 –	A B C D	20 –	A B C D

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MATHEMATICS APTITUDE

Mock Exam 11



The exam is exactly 60:00 minutes



Wear a wrist watch



Sit in a quiet room



White paper and pencils only



Darken the circles correctly



Respect the rules. Never look at the key before you finish

1. A rectangular prism has a length of 8 cm, a width of 5 cm, and a height of h cm. A solid cube with a side length of 4 cm is dropped perfectly into the prism. If the remaining empty volume inside the prism is exactly 136 cm^3 , what is the height h of the prism?
- (a) 3.4 cm (c) 200 cm
(b) 6.4 cm (d) None of the previous
2. $\frac{x^3 - 3x^2 + 4x - 5}{x - 2} =$
- (a) $x^2 - 5x + 14 - \frac{33}{x-2}$ (c) $x^2 - x + 2 - \frac{1}{x-2}$
(b) $x^2 - x + 2$ (d) $x^2 - x + 2 + \frac{1}{x-2}$
3. If $5^{x+1} + 5^x = \frac{6}{5} \cdot 5^3$, what is the value of $x^2 + 1$:
- (a) 10 (c) 26
(b) 2 (d) None of the previous
4. A machine produces 150 standard bolts every 20 minutes. To fulfill a large order, the machine runs continuously for exactly h hours, producing 3150 bolts. What is the value of h ?
- (a) 420 (c) 14
(b) 6.5 (d) None of the previous
5. How many distinct real solutions exist for the equation $|x - k| = |3x|$, where k is a constant not equal to zero?
- (a) 2 (c) 0
(b) 1 (d) None of the previous
6. The domain of $f(x) = \frac{\sqrt{x+6}}{|x|-6}$ is:
- (a) $(-6, 6) \cup (6, \infty)$ (c) $\mathbb{R} \setminus \{\pm 6\}$
(b) $[-6, 6) \cup (6, \infty)$ (d) None of the previous
7. A machine loses 20% of its water capacity every time it runs a cleaning cycle. If the machine contains 64 liters of water after exactly 3 consecutive cleaning cycles, what was the initial amount of water in the machine?
- (a) 125 liters (c) 100 liters
(b) 320 liters (d) None of the previous

8. The solution set of the inequality $(x^2 - 1)(x^2 + 9) \leq 0$ is:
- (a) $[-1, 1]$ (c) $[-1, 1] \cup \{\pm 3\}$
(b) $[-3, 3]$ (d) None of the previous
9. $\frac{4}{5} - \left(\frac{1}{2} - \frac{2}{3}\right) =$
- (a) 29 (c) $-\frac{11}{30}$
(b) $\frac{29}{30}$ (d) $\frac{1}{6}$
10. A cyclist rides at a constant speed of 10 meters per second. How many minutes will it take the cyclist to travel a total distance of 24 kilometers?
- (a) 40 minutes (c) 24 minutes
(b) 2.4 minutes (d) None of the previous
11. $\frac{2^{k+3} + 2^k}{2^{k+2} - 2^k} =$
- (a) 2 (c) 1
(b) $\frac{9}{4}$ (d) 3
12. $\frac{x - a}{x + a} = \frac{1}{2} \implies x = 2a + 4 \implies a =$
- (a) 4 (c) 12
(b) -4 (d) 2
13. A factory produces exactly 100 kg of a metal alloy that is 42% zinc. They create this by melting together two existing alloys: one is 30% zinc and the other is 60% zinc. How many kilograms of the 60% zinc alloy did they use?
- (a) 40 kg (c) 30 kg
(b) 60 kg (d) 50 kg
14. Find the solution set of the inequality $\frac{1}{x^2} \geq \frac{1}{x + 2}$:
- (a) $[-1, 2] \setminus \{0\}$ (c) $(-2, \infty) \setminus \{0, 2\}$
(b) $(-2, 2] \setminus \{0\}$ (d) $(-\infty, 2] \setminus \{0, -2\}$
15. $\frac{x^3 + 1}{x^2 - x + 1} - \frac{x^3 - 1}{x^2 + x + 1} =$
- (a) 2 (c) 0
(b) $2x$ (d) x^2

- 16.** A phone costs 3 times as much as a tablet. A protective case costs 40 KD less than the tablet. If the total cost of all three items is 560 KD, what is the price of the tablet in KD?
- (a) 120 (c) 160
(b) 360 (d) None of the previous
- 17.** Which of the following equations represents y as a function of x ?
- (a) $y|y| = x$ (c) $x = y^4$
(b) $|y| = x^2$ (d) None of the previous
- 18.** $x > 0, y > 0, \quad 9x - 16y =$
- (a) $(3\sqrt{x} - 4\sqrt{y})^2$ (c) $(3\sqrt{x} - 4\sqrt{y})(3\sqrt{x} + 4\sqrt{y})$
(b) $(9\sqrt{x} - 16\sqrt{y})(9\sqrt{x} + 16\sqrt{y})$ (d) None of the previous
- 19.** A construction company uses m identical machines to produce 150 concrete blocks in 5 hours. How many hours will it take 10 such machines to produce 400 concrete blocks?
- (a) $\frac{4m}{3}$ (c) $\frac{40m}{3}$
(b) $\frac{8m}{5}$ (d) None of the previous
- 20.** If x_1 and x_2 are the roots of the equation $x^2 - 2kx + k^2 - a^2 = 0$, what is the distance between the roots $|x_1 - x_2|$?
- (a) $2|a|$ (c) a^2
(b) $2|k|$ (d) None of the previous



Answer Sheet

Mathematics · Mock Exam 11

Use a pencil. Fill the circle completely.

Correct



Wrong



Q's# Answers

1 – (A) (B) (C) (D)

2 – (A) (B) (C) (D)

3 – (A) (B) (C) (D)

4 – (A) (B) (C) (D)

5 – (A) (B) (C) (D)

Q's# Answers

6 – (A) (B) (C) (D)

7 – (A) (B) (C) (D)

8 – (A) (B) (C) (D)

9 – (A) (B) (C) (D)

10 – (A) (B) (C) (D)

Q's# Answers

11 – (A) (B) (C) (D)

12 – (A) (B) (C) (D)

13 – (A) (B) (C) (D)

14 – (A) (B) (C) (D)

15 – (A) (B) (C) (D)

Q's# Answers

16 – (A) (B) (C) (D)

17 – (A) (B) (C) (D)

18 – (A) (B) (C) (D)

19 – (A) (B) (C) (D)

20 – (A) (B) (C) (D)

STOP

Do not turn to the next page

The answer key is next. Keep it hidden until you have finished the whole exam.



Answer Key Mathematics · Mock Exam 11 · correct answers shaded

Q's#	Answers	Q's#	Answers	Q's#	Answers	Q's#	Answers
1 –	☐ A ☐ B ☐ C ☒ D	6 –	☒ A ☐ B ☐ C ☐ D	11 –	☐ A ☐ B ☐ C ☒ D	16 –	☒ A ☐ B ☐ C ☐ D
2 –	☐ A ☐ B ☒ C ☐ D	7 –	☒ A ☐ B ☐ C ☐ D	12 –	☒ A ☐ B ☐ C ☐ D	17 –	☒ A ☐ B ☐ C ☐ D
3 –	☐ A ☐ B ☐ C ☒ D	8 –	☒ A ☐ B ☐ C ☐ D	13 –	☒ A ☐ B ☐ C ☐ D	18 –	☐ A ☐ B ☒ C ☐ D
4 –	☐ A ☐ B ☐ C ☒ D	9 –	☐ A ☒ B ☐ C ☐ D	14 –	☒ A ☐ B ☐ C ☐ D	19 –	☒ A ☐ B ☐ C ☐ D
5 –	☒ A ☐ B ☐ C ☐ D	10 –	☒ A ☐ B ☐ C ☐ D	15 –	☒ A ☐ B ☐ C ☐ D	20 –	☒ A ☐ B ☐ C ☐ D

Learn from your mistakes

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MATHEMATICS APTITUDE

Mock Exam 12



The exam is exactly 60:00 minutes



Wear a wrist watch



Sit in a quiet room



White paper and pencils only



Darken the circles correctly



Respect the rules. Never look at the key before you finish

1. A car drives across a bridge that is exactly 1500 meters long. If the car maintains a constant speed of 90 kilometers per hour, how many seconds does it take to cross the bridge?
- (a) 60 seconds (c) 1 second
(b) 16.6 seconds (d) 100 seconds
2. If $(x^2 + 1)^2 - 5(x^2 + 1) + 4 \leq 0$, what is the length of the interval containing all possible values of x ?
- (a) $2\sqrt{3}$ (c) $\sqrt{3}$
(b) 3 (d) 2
3. If $x \neq 0, t \neq 0$, the following equation is equivalent to: $81x^8 - 16t^8 = 9x^4 + 4t^4$
- (a) $(3x^2 - 2t^2)(3x^2 + 2t^2)(9x^4 + 4t^4) = 0$ (c) $(3x^2 + 2t^2)^2 = 1$
(b) $(3x^2 - 2t^2)(3x^2 + 2t^2) = 1$ (d) $9x^4 + 4t^4 = 0$
4. A stock portfolio valued at 500 KD increases by 20% in January. In February, the new value decreases by 20%. What is the final value of the portfolio at the end of February?
- (a) 480 KD (c) 400 KD
(b) 500 KD (d) None of the previous
5. Find the product of all real solutions for the equation $4^{x^2-1} = 2^{x+1}$:
- (a) $-3/2$ (c) $-1/2$
(b) $3/2$ (d) -3
6. The number of distinct real solutions for the equation $(x^2 + 1)(x - 2)^2(x^2 + x - 6) = 0$ is:
- (a) 2 (c) 5
(b) 3 (d) 0
7. The time t it takes for a pendulum to complete one full swing is directly proportional to the square root of its length L . If a pendulum of length 16 cm takes 2 s to swing, what is the length of a pendulum that takes 3 s to swing?
- (a) 36 cm (c) 9 cm
(b) 24 cm (d) None of the previous
8. Which of the following satisfies both inequalities $|x - 2| < 4$ and $x + 1 \geq 0$?
- (a) $[-1, 6]$ (c) $(-2, -1]$
(b) $(-2, 6)$ (d) None of the previous

9. $(a - 3 + 2b)(a - 3 - 2b) =$
- (a) $a^2 - 6a + 9 - 2b^2$ (c) $a^2 - 6a + 9 - 4b^2$
 (b) $a^2 + 9 - 4b^2$ (d) None of the previous
10. A man deposited a certain amount of money in a bank account offering an 8% annual interest rate. After exactly 3 years, the total accumulated amount (Original Amount + Profit) was 6200 KD. What was the amount of Profit earned during this period?
- (a) 1200 KD (c) 1488 KD
 (b) 5000 KD (d) None of the previous
11. The domain of $f(x) = \frac{\sqrt{x+4}}{|x|-4}$ is:
- (a) $(-4, 4) \cup (4, \infty)$ (c) $[-4, \infty) \setminus \{4\}$
 (b) $[-4, 4) \cup (4, \infty)$ (d) $\mathbb{R} \setminus \{\pm 4\}$
12. If $g(x) = x^2 - x$ and $f(g(x)) = x^4 - 2x^3 + x^2 - 1$, find $f(x)$:
- (a) $x^2 - 1$ (c) $x^4 - x^2 - 1$
 (b) $x^2 - 2x + 1$ (d) None of the previous
13. Five years ago, Noura was exactly half as old as she will be in 8 years from now. How old is Noura currently?
- (a) 18 (c) 26
 (b) 13 (d) None of the previous
14. If $5 - 2x \geq 4x - 7$, what is the smallest possible value of $10 - 3x$?
- (a) 4 (c) 7
 (b) 10 (d) 2
15. $2x^{1/2} - 15x^{-1/2} = 7 \implies x =$
- (a) 5 (c) 9
 (b) $225/4$ (d) None of the previous
16. Painter A can paint a house in 10 days. When Painter A and Painter B work together, they can paint the same house in exactly 6 days. How many days would it take Painter B to paint the house alone?
- (a) 4 (c) 15
 (b) 16 (d) None of the previous

17. $\sqrt{(-6)^2} - |-4| =$

(a) -10

(b) 2

(c) 10

(d) None of the previous

18. $\frac{\frac{2}{5} + \frac{1}{2}}{\frac{3}{10}} =$

(a) $\frac{1}{3}$

(b) 3

(c) $\frac{9}{10}$

(d) $\frac{11}{6}$

19. An empty rectangular container has a square base with a side length of 10 cm. Exactly 1.5 liters of water is poured into the container. What is the exact height of the water level in the container?

(a) 15 cm

(b) 1.5 cm

(c) 150 cm

(d) None of the previous

20. $\frac{y}{y+1} \div \left(1 - \frac{1}{1-y^2}\right) =$

(a) $1 - \frac{1}{y}$

(b) $y - 1$

(c) $\frac{y-1}{y^2}$

(d) None of the previous



Answer Sheet Mathematics · Mock Exam 12

Use a pencil. Fill the circle completely. Correct  Wrong   

Q's#	Answers	Q's#	Answers	Q's#	Answers	Q's#	Answers
1 –	☐ A ☐ B ☐ C ☐ D	6 –	☐ A ☐ B ☐ C ☐ D	11 –	☐ A ☐ B ☐ C ☐ D	16 –	☐ A ☐ B ☐ C ☐ D
2 –	☐ A ☐ B ☐ C ☐ D	7 –	☐ A ☐ B ☐ C ☐ D	12 –	☐ A ☐ B ☐ C ☐ D	17 –	☐ A ☐ B ☐ C ☐ D
3 –	☐ A ☐ B ☐ C ☐ D	8 –	☐ A ☐ B ☐ C ☐ D	13 –	☐ A ☐ B ☐ C ☐ D	18 –	☐ A ☐ B ☐ C ☐ D
4 –	☐ A ☐ B ☐ C ☐ D	9 –	☐ A ☐ B ☐ C ☐ D	14 –	☐ A ☐ B ☐ C ☐ D	19 –	☐ A ☐ B ☐ C ☐ D
5 –	☐ A ☐ B ☐ C ☐ D	10 –	☐ A ☐ B ☐ C ☐ D	15 –	☐ A ☐ B ☐ C ☐ D	20 –	☐ A ☐ B ☐ C ☐ D

STOP

Do not turn to the next page

The answer key is next. Keep it hidden until you have finished the whole exam.



Answer Key Mathematics · Mock Exam 12 · correct answers shaded

Q's#	Answers	Q's#	Answers	Q's#	Answers	Q's#	Answers
1 –	A B C D	6 –	A B C D	11 –	A B C D	16 –	A B C D
2 –	A B C D	7 –	A B C D	12 –	A B C D	17 –	A B C D
3 –	A B C D	8 –	A B C D	13 –	A B C D	18 –	A B C D
4 –	A B C D	9 –	A B C D	14 –	A B C D	19 –	A B C D
5 –	A B C D	10 –	A B C D	15 –	A B C D	20 –	A B C D

Learn from your mistakes

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MATHEMATICS APTITUDE

Mock Exam 13



The exam is exactly 60:00 minutes



Wear a wrist watch



Sit in a quiet room



White paper and pencils only



Darken the circles correctly



Respect the rules. Never look at the key before you finish

1. A food supply depot has enough rations to feed P people for exactly D days. If exactly $\frac{1}{3}$ of the people leave the depot, how many days will the same rations last the remaining people?
- (a) $1.5D$ (c) $3D$
(b) $\frac{D}{3}$ (d) $0.66D$
2. $x > 0$, $x + 8\sqrt{x} + 16 =$
- (a) $(\sqrt{x} - 4)^2$ (c) $(x + 4)^2$
(b) $(\sqrt{x} + 16)^2$ (d) $(\sqrt{x} + 4)^2$
3. $5x^2 + 30x + 7 =$
- (a) $5(x + 3)^2 - 38$ (c) $5(x - 3)^2 - 38$
(b) $5(x + 3)^2 - 2$ (d) $5(x + 3)^2 + 52$
4. Which of the following represents the shortest physical distance?
- (a) 550 cm (c) 52000 mm
(b) 0.05 km (d) 51 m
5. The solution set for the equation $(x^2 + 2x)^2 - 2(x^2 + 2x) = 3$ is:
- (a) $\{1, 3, -1\}$ (c) $\{-3, 1\}$
(b) $\{-1, 1\}$ (d) None of the previous
6. Let $f(x) = \begin{cases} |x + 3|, & x < 0 \\ x^2 - 1, & x \geq 0 \end{cases}$. What is the value of $f(f(-5))$?
- (a) 3 (c) -3
(b) 24 (d) None of the previous
7. In a school election, candidate A received 45% of the total votes. If candidate B received the remaining 330 votes, how many votes did candidate A receive?
- (a) 600 (c) 733.3
(b) 148.5 (d) None of the previous
8. If $2^{x+1} + 2^{2-x} = 9$, the value of $x_1^2 + x_2^2$ is:
- (a) 4 (c) 10
(b) 1 (d) None of the previous

9. $\frac{1}{4} - \left(\frac{5}{6} - 1\right) =$
- (a) 5 (c) $-\frac{19}{12}$
 (b) $-\frac{1}{12}$ (d) $\frac{5}{12}$
10. Worker A can complete a task in 12 hours. Worker B is exactly half as fast as Worker A. Worker A starts the task alone and completes exactly $\frac{2}{3}$ of the total job. Then, Worker A leaves and Worker B finishes the remaining work. What is the total time taken to complete the entire task?
- (a) 12 (c) 24
 (b) 18 (d) None of the previous
11. If the solution to the inequality $5 + kx < 2$ is $x > 1$, what is the value of the constant k ?
- (a) -3 (c) -1
 (b) 3 (d) None of the previous
12. $m(x - n) = p(x + q) \implies x =$
- (a) $\frac{pq+mn}{m-p}$ (c) $\frac{pq+mn}{m+p}$
 (b) $\frac{pq-mn}{m-p}$ (d) None of the previous
13. The length of a rectangular frame is 4 cm more than its width. A photograph is placed inside the frame, leaving a uniform border of 2 cm uncovered around all sides. If the area of the photograph is exactly 45 cm^2 , what is the width of the frame?
- (a) 9 cm (c) 5 cm
 (b) 7 cm (d) None of the previous
14. What is the solution set of the inequality $x^2 + 25 \leq 10x$?
- (a) $\{5\}$ (c) ϕ
 (b) $(-\infty, 5]$ (d) $\mathbb{R}$
15. What is the solution set of the equation $|x^2 + 5x| = |x|$?
- (a) $\{-4, -6\}$ (c) $\{0\}$
 (b) $\{0, -4, -6\}$ (d) None of the previous
16. A trader bought goods for 5000 KD. He sold half of them at a 10% profit and the other half at a 4% loss. What is the total net profit or loss from the entire transaction?
- (a) 150 KD profit (c) 150 KD loss
 (b) 300 KD profit (d) None of the previous

17. $\frac{3a^2b - 6ab^2}{3ab} - (a - 2b) =$

(a) $a - 6ab^2$

(c) $-4b$

(b) $2a - 4b$

(d) 0

18. $\frac{2^{-2} - 3^{-1}}{1 - 6^{-1}} =$

(a) $-\frac{1}{7}$

(c) $\frac{1}{5}$

(b) $\frac{1}{2}$

(d) $-\frac{1}{10}$

19. In a workshop, a technician can repair 5 phones or 2 tablets per day. If a team of 10 technicians repaired a total of 32 devices in one day, and each technician worked on only one type of device, how many technicians repaired phones?

(a) 4

(c) 16

(b) 6

(d) 8

20. The domain of $f(x) = \frac{x^2 - 9}{\sqrt{x^2 - 4x + 3}}$ is:

(a) $(-\infty, 1) \cup (3, \infty)$

(c) $(1, 3)$

(b) $(-\infty, 1] \cup [3, \infty)$

(d) $\mathbb{R} \setminus \{1, 3\}$



Answer Sheet

Mathematics · Mock Exam 13

Use a pencil. Fill the circle completely.

Correct



Wrong



Q's# Answers

1 – (A) (B) (C) (D)

2 – (A) (B) (C) (D)

3 – (A) (B) (C) (D)

4 – (A) (B) (C) (D)

5 – (A) (B) (C) (D)

Q's# Answers

6 – (A) (B) (C) (D)

7 – (A) (B) (C) (D)

8 – (A) (B) (C) (D)

9 – (A) (B) (C) (D)

10 – (A) (B) (C) (D)

Q's# Answers

11 – (A) (B) (C) (D)

12 – (A) (B) (C) (D)

13 – (A) (B) (C) (D)

14 – (A) (B) (C) (D)

15 – (A) (B) (C) (D)

Q's# Answers

16 – (A) (B) (C) (D)

17 – (A) (B) (C) (D)

18 – (A) (B) (C) (D)

19 – (A) (B) (C) (D)

20 – (A) (B) (C) (D)

STOP

Do not turn to the next page

The answer key is next. Keep it hidden until you have finished the whole exam.



Answer Key Mathematics · Mock Exam 13 · correct answers shaded

Q's#	Answers	Q's#	Answers	Q's#	Answers	Q's#	Answers
1 –	A B C D	6 –	A B C D	11 –	A B C D	16 –	A B C D
2 –	A B C D	7 –	A B C D	12 –	A B C D	17 –	A B C D
3 –	A B C D	8 –	A B C D	13 –	A B C D	18 –	A B C D
4 –	A B C D	9 –	A B C D	14 –	A B C D	19 –	A B C D
5 –	A B C D	10 –	A B C D	15 –	A B C D	20 –	A B C D

Learn from your mistakes

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MATHEMATICS APTITUDE

Mock Exam 14



The exam is exactly 60:00 minutes



Wear a wrist watch



Sit in a quiet room



White paper and pencils only



Darken the circles correctly



Respect the rules. Never look at the key before you finish

1. A room is 20 m long and 16 m wide. A rectangular carpet is placed in the center of the room, leaving an uncovered wooden border of equal width around all sides of the carpet. If the area of the carpet is exactly half the area of the room, what is the exact width of the uncovered border?
- (a) 3 m (c) 8 m
(b) 4 m (d) None of the previous
2. $\frac{3x}{3x-4} =$
- (a) $1 + \frac{4}{3x-4}$ (c) $-1 + \frac{4}{3x-4}$
(b) $1 - \frac{4}{3x-4}$ (d) $1 - \frac{3}{3x-4}$
3. Which of the following represents the solution set for $x^2 + 16 \leq 8x$?
- (a) $\{4\}$ (c) ϕ
(b) $(-\infty, 4]$ (d) $\mathbb{R}$
4. The population of a city doubles exactly every T years. If the population was P in the year 2000, and it reached $16P$ in the year 2024, what is the value of T ?
- (a) 6 (c) 8
(b) 4 (d) None of the previous
5. $\frac{10}{\sqrt{7} + \sqrt{2}} =$
- (a) $\frac{10\sqrt{7}-\sqrt{2}}{5}$ (c) $2\sqrt{7} + \sqrt{2}$
(b) $2\sqrt{7} - 2\sqrt{2}$ (d) None of the previous
6. A plumber is connecting three pipes. The first pipe is 1.2 kilometers long, the second is 800 meters long, and the third is 40000 centimeters long. What is the total length of the connected pipes in meters?
- (a) 42000 m (c) 1240 m
(b) 2000 m (d) None of the previous
7. If $f(x) = cx + 2$ and $f(f(x)) = 9x + 8$ for all real values of x , find the value of c :
- (a) 3 (c) 9
(b) -3 (d) 4
8. $2a + b = 7, \quad 2b + c = 10, \quad 2c + a = 13 \implies a + b + c =$
- (a) 30 (c) 20
(b) 15 (d) None of the previous

9. A workshop uses 8 machines working 10 hours a day to finish a task in 21 days. If the workshop uses 12 machines working 14 days, how many hours a day must the machines work to finish the same task?
- (a) 10 (c) 7
(b) 15 (d) 12
10. If x_1 and x_2 are the solutions of the equation $3x^2 - 8x + 2 = 0$, what is the value of $\frac{1}{x_1} + \frac{1}{x_2}$?
- (a) 4 (c) $\frac{2}{3}$
(b) $\frac{8}{3}$ (d) -4
11. An investor deposited 6000 KD in a bank on January 1st at an annual interest rate of 5%. They deposited an additional 4000 KD into the exact same account on July 1st of the same year. What is the total profit generated by the account at the end of December that year?
- (a) 300 KD (c) 450 KD
(b) 500 KD (d) None of the previous
12. Which of the following satisfies both inequalities $2x + 7 < 3$ and $1 - \frac{x}{3} \leq 2$?
- (a) $[-2, \infty)$ (c) $[-3, -2]$
(b) $(-\infty, -3)$ (d) None of the previous
13. Find the solution set of the inequality $\frac{x - 4}{|x - 4|} \leq 0$:
- (a) $(-\infty, 4]$ (c) $(4, \infty)$
(b) $(-\infty, 4)$ (d) $\mathbb{R} \setminus \{4\}$
14. The length of a rectangle is increased by $p\%$, and its width is decreased by 25%. If the area of the new rectangle is exactly equal to the area of the original rectangle, what is the value of p ?
- (a) 33.3 (c) 75
(b) 25 (d) None of the previous
15. $2ax - 6ay - bx + 3by =$
- (a) $(2a - b)(x + 3y)$ (c) $(2a - b)(x^2 - 3y^2)$
(b) $(2a + b)(x - 3y)$ (d) None of the previous

16. Let p be directly proportional to q and inversely proportional to r . If q is tripled and r is doubled, how does the value of p change?
- (a) $p_2 = 1.5p_1$ (c) $p_2 = 0.66p_1$
(b) $p_2 = 6p_1$ (d) None of the previous
17. $\frac{a-b}{a^{-1}-b^{-1}} =$
- (a) $-ab$ (c) $\frac{1}{ab}$
(b) ab (d) $a+b$
18. $2.5 - \frac{1.5}{\frac{3}{4}} =$
- (a) $\frac{4}{3}$ (c) $\frac{11}{8}$
(b) $\frac{1}{2}$ (d) $-\frac{1}{2}$
19. In a theater, the ratio of adults to children is 3 : 5. After 120 more adults enter the theater, the number of adults and children becomes exactly equal. What percentage of the final audience are children?
- (a) 50% (c) 37.5%
(b) 62.5% (d) None of the previous
20. The domain of $f(x) = \frac{\sqrt{x-3}}{x-1}$ is:
- (a) $[3, \infty)$ (c) $[1, \infty)$
(b) $(3, \infty)$ (d) $[3, \infty) \setminus \{1\}$



Answer Sheet

Mathematics · Mock Exam 14

Use a pencil. Fill the circle completely.

Correct



Wrong



Q's# Answers

1 – (A) (B) (C) (D)

2 – (A) (B) (C) (D)

3 – (A) (B) (C) (D)

4 – (A) (B) (C) (D)

5 – (A) (B) (C) (D)

Q's# Answers

6 – (A) (B) (C) (D)

7 – (A) (B) (C) (D)

8 – (A) (B) (C) (D)

9 – (A) (B) (C) (D)

10 – (A) (B) (C) (D)

Q's# Answers

11 – (A) (B) (C) (D)

12 – (A) (B) (C) (D)

13 – (A) (B) (C) (D)

14 – (A) (B) (C) (D)

15 – (A) (B) (C) (D)

Q's# Answers

16 – (A) (B) (C) (D)

17 – (A) (B) (C) (D)

18 – (A) (B) (C) (D)

19 – (A) (B) (C) (D)

20 – (A) (B) (C) (D)

STOP

Do not turn to the next page

The answer key is next. Keep it hidden until you have finished the whole exam.



Answer Key Mathematics · Mock Exam 14 · correct answers shaded

Q's#	Answers	Q's#	Answers	Q's#	Answers	Q's#	Answers
1 –	☐ A ☐ B ☐ C ☒ D	6 –	☐ A ☐ B ☐ C ☒ D	11 –	☐ A ☐ B ☐ C ☒ D	16 –	☒ A ☐ B ☐ C ☐ D
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4 –	☒ A ☐ B ☐ C ☐ D	9 –	☒ A ☐ B ☐ C ☐ D	14 –	☒ A ☐ B ☐ C ☐ D	19 –	☒ A ☐ B ☐ C ☐ D
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Learn from your mistakes

1 Go through your wrong answers one by one.



2 For each one, work out why you made the mistake.



3 Still stuck? Ask an AI to solve it and show you where it went wrong.



4 Write every mistake on a separate sheet, and review it before the next exam.





MATHEMATICS APTITUDE

Mock Exam 15



The exam is exactly 60:00 minutes



Wear a wrist watch



Sit in a quiet room



White paper and pencils only



Darken the circles correctly



Respect the rules. Never look at the key before you finish

1. A department of 50 employees working 9 hours a day can process a batch of data in 4 days. If the project deadline is changed to 3 days and the employees increase their shifts to 10 hours a day, what is the total number of employees required to finish on time?
 - (a) 55
 - (b) 75
 - (c) 45
 - (d) None of the previous

2. Which of the following numbers is the largest?
 - (a) 2^{790}
 - (b) 16^{150}
 - (c) 8^{200}
 - (d) 4^{400}

3. $\frac{\frac{7}{5} - 0.4}{0.5 \times \frac{4}{3}} =$
 - (a) $\frac{3}{2}$
 - (b) $\frac{2}{3}$
 - (c) $\frac{8}{3}$
 - (d) $\frac{13}{7}$

4. A right circular cone and a cylinder have the exact same base radius r . If the volume of the cone is exactly twice the volume of the cylinder, what is the ratio of the height of the cone to the height of the cylinder?
 - (a) 6 : 1
 - (b) 2 : 1
 - (c) 2 : 3
 - (d) None of the previous

5. If $f(x) = \frac{x}{x-1}$ and $g(x) = \frac{1}{x}$, which of the following expressions is equivalent to $f(g(x))$?
 - (a) $\frac{1}{1-x}$
 - (b) $\frac{x}{x-1}$
 - (c) $\frac{x-1}{x}$
 - (d) None of the previous

6. If the surface area of a sphere is decreased by exactly 19%, by what percentage does the radius of the sphere decrease?
 - (a) 19%
 - (b) 9.5%
 - (c) 4.35%
 - (d) None of the previous

7. $(2m - 5n)^3 =$
 - (a) $8m^3 - 125n^3$
 - (b) $8m^3 + 60m^2n - 150mn^2 - 125n^3$
 - (c) $2m^3 - 60m^2n + 150mn^2 - 5n^3$
 - (d) None of the previous

8. The solution set of the inequality $\frac{x+5}{x+1} \geq 2$ is:
 - (a) $(-\infty, 3]$
 - (b) $(-1, 3]$
 - (c) $(-1, 3)$
 - (d) $(-\infty, -1)$

9. A person spends 20% of their monthly salary on savings. The remaining salary is divided between food and rent in the ratio 2 : 1. If the amount spent on rent is 400 KD, what is the total monthly salary?
- (a) 1500 KD (c) 2000 KD
(b) 1200 KD (d) None of the previous
10. What is the solution set of the inequality $\frac{x}{x^2 - 4} \leq 0$?
- (a) $(-\infty, -2) \cup (0, 2]$ (c) $[0, 2]$
(b) $(-\infty, 2]$ (d) None of the previous
11. A recipe for 8 large pancakes requires 1.2 liters of milk. A chef wants to make 20 large pancakes but only has 2.4 liters of milk. How many additional liters of milk does the chef need?
- (a) 0.6 (c) 1.8
(b) 3.0 (d) None of the previous
12. $\frac{3x^2 - 5x - 2}{x^2 - 4} =$
- (a) $3 - \frac{5}{x+2}$ (c) $3 - \frac{1}{x+2}$
(b) $3 + \frac{5}{x+2}$ (d) None of the previous
13. $x^{-4} - 10x^{-2} + 9 =$
- (a) $(x^{-2} - 9)(x^{-2} - 1)$ (c) $(x^{-1} - 3)(x^{-1} + 3)(x^{-1} - 1)(x^{-1} + 1)$
(b) $(x^{-1} - 3)^2(x^{-1} - 1)^2$ (d) None of the previous
14. An investment fund is split into two parts in a ratio of 1 : 3. The smaller part earns an 8% annual profit, and the larger part earns a 4% annual profit. If the total profit from both parts is 400 KD, what is the total value of the investment fund?
- (a) 10000 KD (c) 6000 KD
(b) 2000 KD (d) None of the previous
15. How many distinct real solutions exist for the equation $|x| + \sqrt{|x|} = 12$?
- (a) 1 (c) 4
(b) 2 (d) 0
16. If k is a positive integer, which of the following is always a perfect square?
- (a) 9^{k+1} (c) $3^{2k} + 3^{2k}$
(b) 2^{2k+1} (d) None of the previous

17. The number of real roots for the equation $(x^2 + 25)(|x| + 2)(x - 5) = 0$ is:

- (a) 1
- (b) 3
- (c) 5
- (d) None of the previous

18. The domain of $f(x) = \sqrt{x^2 - 3x} - \frac{1}{\sqrt{x - 4}}$ is:

- (a) $(4, \infty)$
- (b) $(-\infty, 0] \cup [3, \infty)$
- (c) $[3, \infty)$
- (d) None of the previous

19. Three-fifths of a number is 12 more than 20% of the number itself. What is the number?

- (a) 60
- (b) -30
- (c) 15
- (d) None of the previous

20. $4x^{-1/2} - x^{1/2} = 0 \implies 2x + 1 =$

- (a) 9
- (b) 5
- (c) 1
- (d) 4



Answer Sheet

Mathematics · Mock Exam 15

Use a pencil. Fill the circle completely.

Correct



Wrong



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Answer Key Mathematics · Mock Exam 15 · correct answers shaded

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