

XPERTSTEM Mathematics Sample Test for Division 3 (Grade 7-8)

1) Simplify: $3/4 \div 2/3$

- A) 9/8
- B) 8/9
- C) 1/2
- D) 3/8

2) What is the square root of 121?

- A) 11
- B) 12
- C) 10
- D) 13

3) Which of the following is an irrational number?

- A) 0
- B) π
- C) -5
- D) 2/3

4) Solve for x if $3x - 7 = 2$

- A) 5
- B) 4
- C) 2
- D) 3

5) Which of the following represents an inequality?

- A) $x + 3 = 7$
- B) $x > 3$
- C) $x^2 = 9$
- D) $x - 2 = 4$

6) Calculate: $5,6 \times 0,5$

- A) 2,8
- B) 3,6
- C) 2,5
- D) 4,8

7) What is the square of -9?

- A) -81
- B) 81
- C) 72
- D) -72

8) Simplify: $(2/3)^3$

- A) 27/8
- B) 4/9
- C) 6/27
- D) 8/27

9) Identify the property: $a + b = b + a$

- A) Associative
- B) Commutative
- C) Distributive
- D) Identity

10) Solve for x if $4x + 5 = 17$

- A) 2
- B) 3
- C) 4
- D) 5

11) Solve for x and y for equations:

$$x + y = 10 \text{ and } x - y = 4$$

- A) $x=6, y=4$
- B) $x=7, y=3$
- C) $x=5, y=5$
- D) $x=8, y=2$

12) Which of the following is a linear equation?

- A) $x^2 + y^2 = 9$
- B) $y = 2x + 3$
- C) $xy^2 = 12$
- D) $x^3 - y^3 = 8$

13) What is the probability of rolling a 3 on a standard six-sided die?

- A) 1/3
- B) 1/6
- C) 3/6
- D) 1/4

14) If the ratio of boys to girls in a class is 2:3 and there are 20 students, how many are boys?

- A) 8
- B) 10
- C) 12
- D) 6

15) Solve for x:

$$2x + 3y = 12, \text{ if } y = 2$$

- A) $x = 3$
- B) $x = 2$
- C) $x = 6$
- D) $x = 4$

16) A coin is tossed 3 times. What is the total number of possible outcomes?

- A) 3
- B) 6
- C) 8
- D) 12

17) Find the missing number in the proportion: $4/5 = x/20$

- A) 16
- B) 15
- C) 18
- D) 20

18) What is the slope of the line passing through points (1, 2) and (4, 8)?

- A) 2
- B) 3
- C) 4
- D) 6

19) A bag contains 5 red balls and 3 blue balls. What is the probability of drawing a red ball?

- A) 5/8
- B) 3/8
- C) 1/2
- D) 3/5

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20) The sum of two numbers is 45, and their ratio is 2:3. What is the smaller number?

- A) 15
- B) 25
- C) 20
- D) 18

21) A regular hexagon has how many sides?

- A) 5
- B) 6
- C) 7
- D) 8

22) Calculate the circumference of a circle with a radius of 7 cm. (Use $\pi = 22/7$)

- A) 22 cm
- B) 44 cm
- C) 14 cm
- D) 21 cm

23) What is the length of the hypotenuse of a right triangle with legs of 6 cm and 8 cm?

- A) 10 cm
- B) 12 cm
- C) 14 cm
- D) 15 cm

24) Which of the following triangles are congruent?

- A) Two triangles with equal sides
- B) Two triangles with equal areas
- C) Two triangles with equal angles
- D) None of the above

25) Find the area of a triangle with a base of 10 cm and a height of 8 cm.

- A) 40 cm²
- B) 80 cm²
- C) 100 cm²
- D) 20 cm²

26) A cylinder has a radius of 3 cm and a height of 5 cm. What is its volume? (Use $\pi = 3.14$)

- A) 141.3 cm³
- B) 45 cm³
- C) 150 cm³
- D) 70.8 cm³

27) A prism has a base area of 12 cm² and a height of 10 cm. What is its volume?

- A) 120 cm³
- B) 130 cm³
- C) 140 cm³
- D) 150 cm³

28) What is the surface area of a cube with a side length of 4 cm?

- A) 16 cm²
- B) 64 cm²
- C) 48 cm²
- D) 96 cm²

29) A rectangle has a length of 12 cm and a width of 5 cm. What is its diagonal length?

- A) 13 cm
- B) 14 cm
- C) 15 cm
- D) 16 cm

30) How many diagonals does a pentagon have?

- A) 5
- B) 7
- C) 10
- D) 12