XPERT Mathematics Competition – Sample Exam for Grade 7 and 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 a rational number?
A) $\sqrt{2}$
B) π
C) -5
D) 2/3

4) Solve for x if $3x - 7 = 2$
A) 3
B) 4
C) 2
D) 5

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

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:
$x + y = 10$ 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) $xy = 12$
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) 1/2
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:
$2x + 3y = 12$,
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

20) The sum of two numbers is 45, and their ratio is 2:3. What is the smaller number?
A) 15
B) 18
C) 20
D) 25

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 π = 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 cm^2
B) 80 cm^2
C) 100 cm^2
D) 20 cm^2

26) A cylinder has a radius of 3 cm and a height of 5 cm. What is its volume? (Use π = 3,14)
A) 141.3 cm^3
B) 45 cm^3
C) 150 cm^3
D) 70.8 cm^3

27) A prism has a base area of 12 cm^2 and a height of 10 cm. What is its volume?
A) 120 cm^3
B) 130 cm^3
C) 140 cm^3
D) 150 cm^3

28) What is the surface area of a cube with a side length of 4 cm?
A) 16 cm^2
B) 64 cm^2
C) 96 cm^2
D) 48 cm^2

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 regular pentagon have?
A) 5
B) 7
C) 10
D) 12