

1) Simplify: $(3x + 2)(x - 4) - (x + 2)^2$.

A) $2x^2 - 6x - 8$

B) $x^2 - 6x - 8$

C) $2x^2 - 8x - 12$

D) $x^2 - 8x - 12$

2) Find the solution for $x: (x+3)(x-5)=0$.

A) $x=-3, 5$

B) $x=3, -5$

C) $x=-3, -5$

D) $x=3, 5$

3) Expand: $(x+2)(2x-3)$.

A) $2x^2 + x - 6$

B) $2x^2 - x - 6$

C) $2x^2 + 7x - 3$

D) $2x^2 - x + 3$

4. Solve the inequality: $2x-3>5$.

A) $x>2$

B) $x<4$

C) $x>4$

D) $x<2$

5) Find the solution set for $|x-3| < 5$.

A) $-2 < x < 8$

B) $-5 < x < 5$

C) $-3 < x < 3$

D) $-8 < x < 2$

6) Solve for $x: x^2 - 4x + 3 \leq 0$.

A) $1 \leq x \leq 3$

B) $x \leq 1$ or $x \geq 3$

C) $x \geq 1$ or $x \leq 3$

D) $1 \leq x < 3$

7) Find the remainder when $f(x)=2x^3-3x^2+4x-5$ is divided by $(x-2)$.

A) -3

B) 5

C) -5

D) 3

8) What is the remainder when $f(x)=x^4-2x^3+x+6$ is divided by $(x+1)$?

A) 4

B) 6

C) 2

D) -2

9) Determine whether $(x-2)$ is a factor of $f(x)=x^3-3x^2+2x-4$.

A) Yes

B) No

C) Cannot be determined

D) None of these

10) Find a factor of $f(x)=x^3+2x^2-x-2$.

A) $(x-1)$

B) $(x+1)$

C) $(x+2)$

D) $(x-2)$

11) Simplify: $\log_3 27 + \log_3 \frac{1}{9}$.

A) 0

B) 1

C) 2

D) -1

12) If $\log_2 x = 3$, find x .

A) 6

B) 8

C) 9

D) 10

13) Simplify: $(2+3i)+(4-i)$.

A) $6+2i$

B) $6-2i$

C) $-2+2i$

D) $-6+2i$

14) Find the product: $(2+i)(2-i)$.

A) 5

B) -5

C) $4+2i$

D) $4-2i$

15) Find the coefficient of x^2 in the expansion of $(2x+3)^3$.

A) 24

B) 36

C) 12

D) 18

XPERTXPERTSTEM Mathematics Sample Test for Division 5 (Grade 11-12)

16) Find the constant term in the expansion of $(x+2)^4$.

- A) 16
- B) 32
- C) 64**
- D) 128

17) Solve the equation: $2\sin^2(x) - \sin(x) - 1 = 0$

- A) $x=0, \pi/2$
- B) $x=\pi/6, \pi/3$
- C) $x=\pi/6, 5\pi/6$**
- D) $x=5\pi/6, 3\pi/2$

18) Find the sum of the first 10 terms of the arithmetic sequence: 3,7,11,...

- A) 175**
- B) 185
- C) 195
- D) 205

19) What is the sum of the geometric series $2+4+8+\dots$ up to 6 terms?

- A) 126
- B) 128**
- C) 130
- D) 132

20) Solve for x: $2x^3 - 5x^2 + 4x - 1 = 0$ has $x=1$ as a root. Find the other roots.

- A) $x=1, 2$**
- B) $x=-1, 2$
- C) $x=1, 3$
- D) $x=-1, 3$

21) Simplify: $(1+2i)(3-4i)$.

- A) $11-2i$**
- B) $-11+2i$
- C) $11+10i$
- D) $-11-10i$

22) Find the modulus of the complex number $3+4i$.

- A) 5**
- B) 7
- C) 25
- D) 4

23) Evaluate: $\sum_{n=1}^5 (2n - 1)$.

- A) 15
- B) 25**

- C) 10
- D) 30

24) How many ways can 5 students sit in a row of 5 chairs?

- A) 20
- B) 60
- C) 120**
- D) 24

25) A committee of 3 people is to be selected from a group of 7. How many different committees can be formed?

- A) 35**
- B) 21
- C) 42
- D) 49

26) Solve for x: $e^{2x} - 5e^x + 6 = 0$.

- A) $x=\ln(2), \ln(3)$**
- B) $x=\ln(3), \ln(5)$
- C) $x=2, 3$
- D) $x=0, 1$

27) Find the area of a triangle with vertices at $(0,0), (4,0), (4,3)$.

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

28) Solve the inequality: $x^2 - 4x + 3 > 0$.

- A) $x < 1$ or $x > 3$**
- B) $x > 1$ and $x < 3$
- C) $x < 1$ and $x > 3$
- D) $x > 1$ or $x < 3$

29) Simplify: $\log_5(25) - \log_5(5)$.

- A) 0
- B) 1**
- C) 2
- D) 3

30) Solve for x: $x^3 + 2x^2 - x - 2 = 0$.

- A) $x=-2, 1, -1$
- B) $x=2, -1, 1$
- C) $x=-2, -1, 1$**
- D) $x=-2, 1, 2$