



# ST. FRANCIS COLLEGE

THE SMALL COLLEGE OF BIG DREAMS

## Academic Enhancement Center Sample Math Placement Exam

**Note: This is a SAMPLE exam**

- $16x^2 - 49 =$ 
  - $(4x - 7)^2$
  - $4(x - 7)(x + 7)$
  - $(4x - 7)(4x + 7)$
  - $(16x - 7)(16x + 7)$
  
- $(3x^3y^2)^3 =$ 
  - $9x^6y^5$
  - $9x^6y^6$
  - $27x^6y^5$
  - $27x^9y^6$
  
- $36a^2 + 60ab + 25b^2 =$ 
  - $(6a + 5b)^2$
  - $(6a - 5b)(6a + 5b)$
  - $(6a - 5b)^2$
  - $(12a + 5b)(12a + 5b)$
  
- Which rational expression is in simplest form?
  - $\frac{x^2 + 2x}{x^2 + 2x}$
  - $\frac{x^2 + 2x}{x^2 + 4x}$

(C)  $\frac{x^2 + 2x}{x + 2}$

(D)  $\frac{x^2 + 2x}{x^2 + 4}$

5.  $(8x - 3)^2 =$

(A)  $64x^2 - 9$

(B)  $64x^2 + 9$

(C)  $64x^2 - 48x + 9$

(D)  $64x^2 - 48x - 9$

6.  $\frac{6}{x+6} = 5$  then  $x$  equals

(A) 0

(B) -1

(C)  $-\frac{24}{5}$

(D)  $-\frac{5}{24}$

7.  $a^3b - ab^3 =$

(A)  $a^2b(a - b)$

(B)  $-a^2b(a + b)$

(C)  $ab(a^2 + b^2)$

(D)  $ab(a + b)(a - b)$

8. John is 7 years older than Sam. Their combined age is 45 years. If Sam's age is represented by  $x$ , which of the following is an equation that can be used to find Sam's age?

(A)  $x + 7 = 45$

(B)  $x + x - 7 = 45$

(C)  $x(x + 7) = 45$

(D)  $x + x + 7 = 45$

9. If  $|9-x|=12$  then  $x =$

- (A)  $-3$  only
- (B)  $21$  only
- (C)  $-3$  or  $21$
- (D)  $3$  or  $-21$

10. If  $A = 2xy$ , then  $y =$

- (A)  $A - 2x$
- (B)  $Ax - 2$
- (C)  $\frac{2x}{A}$
- (D)  $\frac{A}{2x}$

11. A jar contains 3 red marbles and 4 blue marbles. If a marble is chosen at random, what is the probability that the marble will be red?

- (A)  $\frac{1}{3}$
- (B)  $\frac{3}{4}$
- (C)  $\frac{4}{7}$
- (D)  $\frac{3}{7}$

12. If the average (mean) of  $x+1$ ,  $x+4$ , and  $x+7$  is 20, what is the value of  $x$ ?

- (A) 16
- (B) 17
- (C) 20
- (D) 24

13. Given the following system:  $\begin{cases} y = 2x + 1 \\ 3x + y = -4 \end{cases}$  what is the value of  $x$ ?

- (A) 1
- (B) -1
- (C) 2
- (D) -2

14. The expression:  $\frac{6}{4-\sqrt{7}}$  is equivalent to:

- (A)  $\frac{4+\sqrt{7}}{3}$
- (B)  $\frac{2(4+\sqrt{7})}{3}$
- (C)  $4+\sqrt{7}$
- (D)  $6(4+\sqrt{7})$

15. What are the roots to the following equation  $2x^2 + 5x - 3 = 0$  ?

- (A) -3 and 2
- (B) -3 and  $\frac{1}{2}$
- (C) -2 and  $\frac{1}{3}$
- (D) -2 and -3

16. What is the slope of the line segment joined by the points  $(2,7)$  and  $(-2,6)$

- (A)  $\frac{1}{2}$
- (B)  $\frac{1}{4}$
- (C)  $-\frac{1}{2}$
- (D)  $-\frac{1}{4}$

17. Which of the following is equivalent to:  $-2x+12 \leq 4$

- (A)  $x \leq 4$
- (B)  $x \geq 4$
- (C)  $x \leq -4$
- (D)  $x \geq -4$

18. A rectangle of length  $x$  and width  $y$  has a perimeter of 50 and an area of 150. Which of the following pairs of equations can be used to find  $x$  and  $y$ ?

- (A)  $\begin{cases} x + y = 50 \\ xy = 150 \end{cases}$
- (B)  $\begin{cases} 2(x + y) = 50 \\ xy = 150 \end{cases}$
- (C)  $\begin{cases} x + y = 150 \\ xy = 50 \end{cases}$
- (D)  $\begin{cases} 2(x + y) = 150 \\ xy = 50 \end{cases}$

19. At Roosevelt High School, a student scored 70, 90, and 75 on his first three exams. What must he get on his fourth exam to have a final average of 80?

- (A) 88
- (B) 85
- (C) 87
- (D) 89

20.  $\frac{2}{x-2} - \frac{2}{x+2} =$

- (A) 0
- (B)  $\frac{2}{x}$
- (C)  $\frac{8}{x^2 - 4}$

(D)  $\frac{8x}{x^2 - 4}$

21. Cary has 4 pairs of shirts and 5 pairs of pants. How many different outfits consisting of 1 shirt and 1 pair of pants can he wear?

- (A) 9
- (B) 4
- (C) 5
- (D) 20

22. Find the slope of the equation  $-2x - y = 3$

- (A) 2
- (B) 3
- (C) -1
- (D) -2

23. The roots of the equation  $x^2 - 4x - 3 = 0$  are

- (A)  $2 \pm \sqrt{7}$
- (B)  $-2 \pm \sqrt{7}$
- (C)  $4 \pm \sqrt{7}$
- (D)  $-4 \pm \sqrt{7}$

24. Which of the following is the equation of a line with slope of  $\frac{1}{3}$  and contains the point

$(3, -7)$ ?

- (A)  $y - 7 = \frac{1}{3}(x - 3)$
- (B)  $y - 7 = \frac{1}{3}(x + 3)$
- (C)  $y + 7 = \frac{1}{3}(x - 3)$
- (D)  $y + 7 = \frac{1}{3}(x + 3)$

25. What are all values of  $x$  for which  $4x^2 - 2x \leq 0$

(A)  $x \leq 0$

(B)  $x \geq \frac{1}{2}$

(C)  $0 \leq x \leq \frac{1}{2}$

(D)  $x \leq 0$  or  $x \geq \frac{1}{2}$

26. Simplify:  $(9x^4)^{\frac{3}{2}}$

(A)  $3^5 x^{\frac{5}{2}}$

(B)  $6x^{\frac{8}{3}}$

(C)  $9x^6$

(D)  $27x^6$

27. The product of  $\frac{5-y}{(3y)^2}$  and  $\frac{9y^2}{y-5}$  is:

(A) 1

(B) -1

(C) 3

(D) -3

28. The expression  $\sqrt{27} + \sqrt{12}$  is equivalent to

(A)  $5\sqrt{3}$

(B)  $13\sqrt{3}$

(C)  $5\sqrt{6}$

(D)  $\sqrt{39}$

29. If  $(2x+3)(x-5)$  is written in the form  $ax^2 + bx + c$ , what is the value of  $c$

- (A)  $-2$
- (B)  $-15$
- (C)  $2$
- (D)  $-7$

30. The solution set of the equation  $\sqrt{y-2} = 2-y$  is:

- (A) 2 and 3
- (B) 2 only
- (C) 3 only
- (D) Neither 2 nor 3