

# Comprehensive Algebra Drill

The answers can be found in Part IV.

3. If  $x + y = 4$  and  $x - y = 2$ , then  $x^2 - y^2 =$

(A) 4  
(B) 6  
(C) 8  
(D) 12  
(E) 20

9. If  $(x + 4)^2 = 63$ , then  $x =$

(A) -1.63  
(B) -0.63  
(C) 1.78  
(D) 3.94  
(E) 6.1

15. What are all the values of  $x$  for which  $|x + 5| < 2$ ?

(A)  $x > -3$  or  $x < -7$   
(B)  $x < -7$   
(C)  $x > -3$   
(D)  $-7 < x < -3$   
(E)  $-3 < x < 7$

19. If  $a + 3b + 6c = 12$ ,  $-2a + b - c = 5$ , and  $4a - 2b - 4c = 1$ , then  $3a + 2b + c =$

(A) -10  
(B) 0  
(C) 10  
(D) 16  
(E) 18

20. For what value of  $x$  is  $\frac{5x}{4x-2}$  undefined?

(A) -1  
(B)  $-\frac{1}{2}$   
(C) 0  
(D)  $\frac{1}{2}$   
(E) 1

23. If  $x \neq 0$ , then  $(2^{3x})(8^{2x}) =$

(A)  $2^{5x}$   
(B)  $2^{6x}$   
(C)  $2^{9x}$   
(D)  $8^{5x}$   
(E)  $16^{5x}$

24. A train traveled 500 miles at an average speed of 60 miles per hour. Approximately how much longer would this same 500-mile trip take if the average speed had decreased by 25%?

(A)  $3\frac{1}{2}$  hours  
(B)  $2\frac{7}{8}$  hours  
(C)  $2\frac{3}{4}$  hours  
(D)  $1\frac{3}{4}$  hours  
(E) 1 hour

25. If  $y$  is directly proportional to  $x^3$  and  $y = 1.2$  when  $x = 4$ , what is the value of  $y$  when  $x = 12$ ?

(A) 0.04  
(B) 22.4  
(C) 32.4  
(D) 37.6  
(E) 40.1

27. If  $j$  and  $k$  are both odd integers, which of the following must also be an odd integer?

(A)  $(j + k)^5$   
(B)  $(j + k)^4$   
(C)  $j^5 + k^5 + 1$   
(D)  $j^4 + k^4 + 2$   
(E)  $\frac{j^5 + k^5}{5}$

30. The sum of the two roots of a quadratic equation is 6 and their product is 8. Which of the following could be the equation.

- (A)  $x^2 - 6x + 8 = 0$
- (B)  $x^2 + 8x - 6 = 0$
- (C)  $x^2 - 8x + 6 = 0$
- (D)  $x^2 + 6x - 8 = 0$
- (E)  $x^2 - 6x - 8 = 0$

36. The distance, in feet, that an object travels is a function of the time over which it travels. In the equation  $d(t) = at + \frac{1}{2}bt^2$ ,  $d(t)$  represents the distance, in feet, traveled,  $t$  represents the time, in seconds, spent traveling, and  $a$  and  $b$  are constants. If  $a = 10$  m/s and  $b = 4$  m/s<sup>2</sup>, which of the following is the closest approximation to the time it would take, in seconds, for an object to travel 36 feet?

- (A) 0.8
- (B) 1.8
- (C) 2.4
- (D) 4.6
- (E) 8.4