

1.  $\frac{20b^3 - 8b}{4b}$
- (A)  $5b^2 - 2b$   
(B)  $5b^3 - 2$   
(C)  $5b^2 - 8b$   
(D)  $5b^2 - 2$

$$\frac{3}{w} - \frac{4}{3} = \frac{5w}{10w^2}$$

2. In the equation above, what is the value of  $w$ ?

- (A)  $\frac{15}{8}$   
(B)  $\frac{18}{11}$   
(C)  $\frac{23}{12}$   
(D)  $\frac{13}{6}$

$$P = 4x - z + 3y$$

$$Q = -x + 4z + 3y$$

3. Using the definitions above for  $P$  and  $Q$ , what is  $2P - Q$ ?

- (A)  $7x - 6z + 3y$   
(B)  $9x + 2z + 9y$   
(C)  $9x - 6z + 3y$   
(D)  $7x - 6z + 9y$

4. If  $(x - y)^2 = 50$  and  $xy = 7$ , what is the value of  $x^2 + y^2$ ?

- (A) 8  
(B) 36  
(C) 43  
(D) 64

5. If  $p = \frac{a}{a-b}$  and  $a \neq b$ , then, in terms of  $a$  and  $b$ ,  $1 - p =$

- (A)  $\frac{a}{b-a}$   
(B)  $\frac{b}{b-a}$   
(C)  $\frac{a}{a-b}$   
(D)  $\frac{b}{a-b}$

6. If  $(a - b)^2 + (a + b)^2 = 24$ , then  $a^2 + b^2 =$

- (A) 4
- (B) 12
- (C) 16
- (D) 18

$$\frac{2}{p} - \frac{1}{2p} = \frac{p^2 + 1}{p^2 + 1}$$

7. In the equation above, what is the value of  $\frac{1}{p}$ ?

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

8. If  $r = t + 2$  and  $s + 2 = t$ , then  $rs =$

- (A)  $t^2$
- (B) 4
- (C)  $t^2 - 4$
- (D)  $t^2 - 4t + 4$

9. Which statement is true for all real values of  $x$  and  $y$ ?

- (A)  $(x + y)^2 = x^2 + y^2$
- (B)  $x^2 + x^2 = x^4$
- (C)  $\frac{2^{x+2}}{2^x} = 4$
- (D)  $(3x)^2 = 6x^2$

10. If  $(p - q)^2 = 25$  and  $pq = 14$ , what is the value of  $(p + q)^2$ ?

- (A) 25
- (B) 36
- (C) 53
- (D) 81

11. If  $\frac{a}{2} - \frac{b}{3} = 1$ , what is  $2a + 3b$  in terms of  $b$ ?

- (A)  $\frac{7b}{3} + 1$
- (B)  $\frac{13b}{3} + 4$
- (C)  $\frac{13b + 1}{3}$
- (D)  $\frac{17b}{3}$

12. If  $(x + 5)(x + p) = x^2 + 2x + k$ , then

- (A)  $p = 3$  and  $k = 5$
- (B)  $p = -3$  and  $k = 15$
- (C)  $p = 3$  and  $k = -15$
- (D)  $p = -3$  and  $k = -15$

13. For what value of  $p$  is  $(x - 2)(x + 2) = x(x - p)$ ?

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

$$\frac{m}{2} - \frac{3(m-4)}{5} = \frac{5(3-m)}{6}$$

14. What value of  $m$  makes the equation above a true statement?

- (A)  $\frac{8}{27}$
- (B)  $\frac{3}{22}$
- (C)  $\frac{62}{27}$
- (D)  $\frac{147}{22}$

15. If  $\left(k + \frac{1}{k}\right)^2 = 16$ , then  $k^2 + \frac{1}{k^2}$

- (A)  $4$
- (B)  $8$
- (C)  $12$
- (D)  $14$

16. If  $\frac{a}{b} = 1 - \frac{x}{y}$ , then  $\frac{b}{a} =$

- (A)  $\frac{x}{y-x}$
- (B)  $\frac{y}{x} - 1$
- (C)  $\frac{y}{x-y}$
- (D)  $\frac{y}{y-x}$

$$\frac{11+s}{12r} = \frac{1}{6} + \frac{1-3s}{4r}$$

17. In the equation above, what is  $r$  in terms of  $s$ ?

(A)  $r = 5s + 4$

(B)  $r = \frac{s-2}{3}$

(C)  $r = 4s + 5$

(D)  $r = \frac{s+3}{2}$

## Grid-In

1. If  $(3y - 1)(2y + k) = ay^2 + by - 5$  for all values of  $y$ , what is the value of  $a + b$ ?

2. If  $4x^2 + 20x + r = (2x + s)^2$  for all values of  $x$ , what is the value of  $r - s$ ?

$$\frac{5}{8} = \frac{-(11-7y)}{4y} + \frac{1}{2y} - \frac{1}{8}$$

3. What value of  $y$  makes the equation above a true statement?

