Build a rectangle and find the factors. Check by multiplying.

1. $X^2 + 4X + 4$

2. $X^2 + 5X + 6$

3. $X^2 + 11X + 10$

4. $X^2 + 6X + 8$

5. $X^2 + 8X + 7$

6. $X^2 + 8X + 12$

7. $X^2 + 12X + 11$

8. $X^2 + 7X + 6$

9. $X^2 + 9X + 14$

10. $X^2 + 16X + 15$

11. $X^2 + 3X + 2$

12. $X^2 + 4X + 3$

13. $X^2 + 9X + 8$

14. $X^2 + 19X + 18$

15. $X^2 + 9X + 20$

16. $X^2 + 10X + 21$

Find the factors and check by multiplying. (You will not have enough blocks to build some of these.)

1. $X^2 + 10X + 16$

2. $X^2 + 11X + 28$

3. $X^2 + 13X + 22$

4. $X^2 + 7X + 12$

5. $X^2 + 8X + 15$

6. $X^2 + 11X + 30$

7. $X^2 + 5X + 4$

8. $X^2 + 6X + 5$

9. $X^2 + 8X + 16$

10. $X^2 + 12X + 20$

11. $X^2 + 11X + 18$

12. $X^2 + 17X + 30$

13. $X^2 + 7X + 10$

14. $X^2 + 2X + 1$

15. $X^2 + 10X + 25$

16. $X^2 + 26X + 25$

Build a rectangle and find the factors.

1. $X^2 + 7X + 12 = ($ $+$ $)($ $+$ $)$

2. $X^2 + 10X + 16 = ($ $+$ $)($ $+$ $)$

3. $X^2 + 11X + 24 = ($ $+$ $)($ $+$ $)$

4. $X^2 + 8X + 12 = ($ $+$ $)($ $+$ $)$

Build a rectangle and find the area (product).

5. $(X + 4)(X + 2) =$

6. $(X + 5)(X + 3) =$

7. Find the factors: $X^2 + 7X + 6$.

8. Check #7 by multiplying the factors to find the product.

9. Find the factors: $X^2 + 2X + 1$.

10. Check #9 by multiplying the factors to find the product.

Add.

11. $2X^2 - 7X - 3$
$\underline{+ X^2 + 5X + 9}$

12. $6X^2 + 2X + 1$
$\underline{+ X^2 - 4X + 3}$

When simplifying expressions with exponents, write your answer on one line unless otherwise instructed.

13. Simplify: $(P^{-4})^2 P^3 P^1$

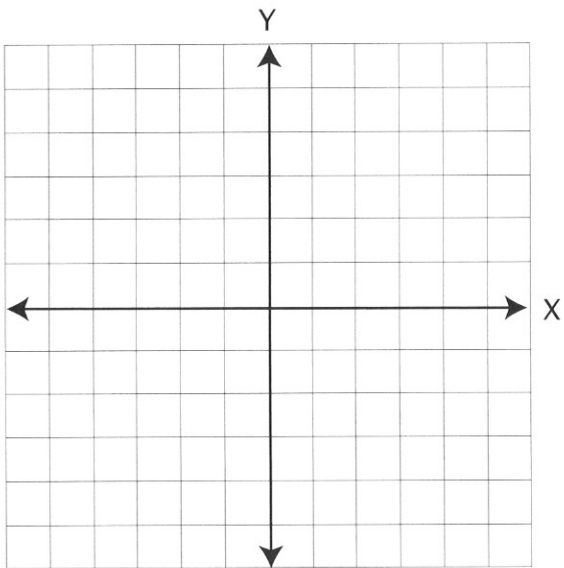14. Simplify: $(R^{-2}S^3)^{-3}$

15. $15^2 =$

16. $\sqrt{16} =$

17. Find three consecutive odd integers such that eleven times the first, plus two times the second, equals six times the third, plus one.

18. Nine coins made up of dimes and nickels have a total value of $.60. How many are there of each coin?

19. Express using the standard form of the equation of a line: $Y = 7X + 3$.

20. Graph: $4Y < 3X - 5$.

Build a rectangle and find the factors.

1. $X^2 + 11X + 28 = ($ $+$ $)($ $+$ $)$

2. $X^2 + 4X + 4 = ($ $+$ $)($ $+$ $)$

3. $X^2 + 6X + 8 = ($ $+$ $)($ $+$ $)$

4. $X^2 + 8X + 16 = ($ $+$ $)($ $+$ $)$

Build a rectangle and find the area (product).

5. $(X + 5)(X + 1) =$

6. $(X + 3)(X + 3) =$

7. Find the factors: $X^2 + 12X + 32$.

8. Check #7 by multiplying the factors to find the product.

9. Find the factors: $X^2 + 20X + 100$.

10. Check #9 by multiplying the factors to find the product.

Add.

11. $X^2 + X - 4$
    $+ X^2 + 3X + 3$

12. $2X^2 + 7X + 6$
    $+ 5X^2 - 4X + 10$

13. Simplify: $[(P^5)^3]^{-2}$

14. Simplify: $(S^6 R^{-3} S^2)^0$
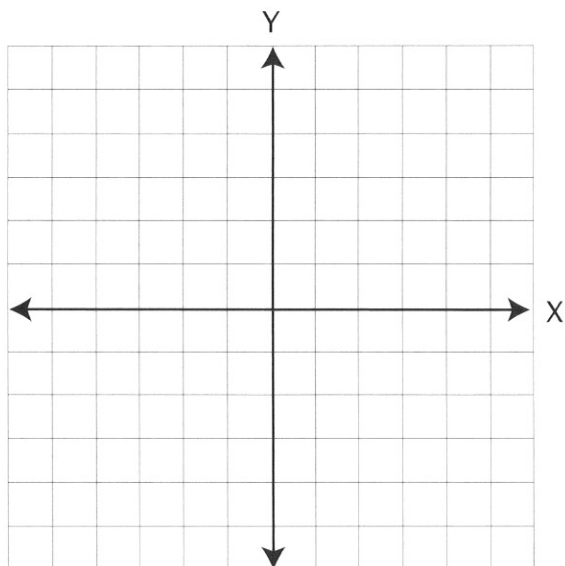
15. $11^2 =$

16. $\sqrt{144} =$

17. Find three consecutive odd integers such that fourteen times the second, plus four times the first, equals twelve times the third, minus two.

18. Twenty-seven coins made up of dimes and nickels add up to a total of $1.80. How many are there of each coin?

19. Graph the line $Y = 3/2\ X - 1$.

20. Graph a line perpendicular to the line in #19 that passes through (3, -3).

Build a rectangle and find the factors.

1. $X^2 + 8X + 7 = ($ $+$ $)($ $+$ $)$

2. $X^2 + 5X + 6 = ($ $+$ $)($ $+$ $)$

3. $X^2 + 9X + 20 = ($ $+$ $)($ $+$ $)$

4. $X^2 + 8X + 15 = ($ $+$ $)($ $+$ $)$

Build a rectangle and find the area (product).

5. $(X + 1)(X + 9) =$

6. $(X + 7)(X + 2) =$

7. Find the factors: $X^2 + 7X + 12$.

8. Check #7 by multiplying the factors to find the product.

9. Find the factors: $X^2 + 10X + 21$.

10. Check #9 by multiplying the factors to find the product.

Add.

11. $4X^2 - 4X + 1$
   $+ X^2 + 2X - 1$

12. $2X^2 + 3X + 3$
   $+ X^2 + 7X - 2$
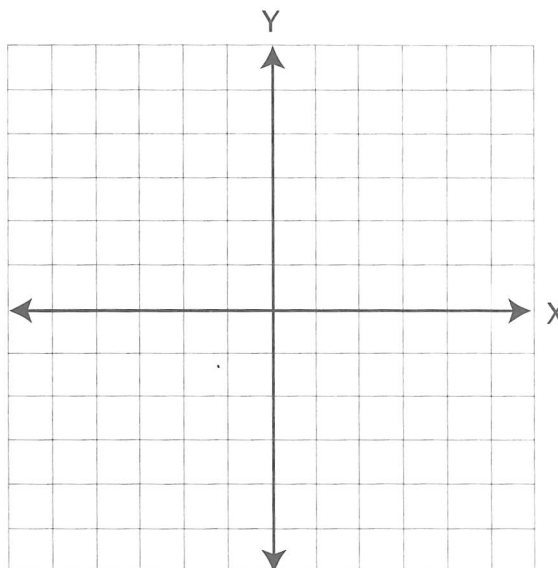
13. Simplify: $(P^3)^0 P^4 P^{-1}$

14. Simplify: $(S^2 R^0 S^0)^{-2} R^5$

15. $13^2 =$

16. $\sqrt{25} =$

17. Find three consecutive integers such that the second, plus seven times the third, equals five times the first.

18. Twenty coins made up of pennies and nickels add up to $.76. How many are there of each coin?

19. Rewrite in slope-intercept form: $4Y + 3X = 16$.

20. Graph: $2Y \geq 3X - 2$.

Solve for the unknown.

1. $X + 3 = 9$

2. $X + 6 = 10$

3. $2X + 5 = 11$

4. $4Q - 2 = 10$

5. $4X + 2 = 2X + 8$

6. $3Y + 5 = 2Y + 7$

7. $Q + 4 = 3Q - 6$

8. $2R + 8 = 3R - 2$

Larger or smaller? (Use <, >, or = in the oval.)

9. $9 - 3$ ◯ $|4 - 11|$

10. $|1 - 2 - 3|$ ◯ $|2 \cdot 3|$

Solve.

11. $(-3) \cdot 4 + 6^2 \cdot (-3) + 5^2 =$

12. $(14 - 9 + 2^2) - (3 \div 6 \cdot 2^2) =$

13. $\dfrac{4}{3} \times \dfrac{6}{10} \div \dfrac{2}{3} =$

14. $(.17)(.8) =$

15. $(-8)(-7) =$

16. $(-4)^2 =$

QUICK TIP

The least common multiple (LCM) is useful for simplifying some equations before solving.

EXAMPLE 1   Solve $\dfrac{3}{4} A + \dfrac{1}{2} = \dfrac{7}{10}$

$4 = 2 \times 2, 2 = 2, 10 = 2 \times 5$
So LCM $= 2 \times 2 \times 5 = 20$

Multiply each term by 20.

$$\left(\overset{5}{\cancel{20}}\right)\dfrac{3}{\cancel{4}} A + \left(\overset{10}{\cancel{20}}\right)\dfrac{1}{\cancel{2}} = \left(\overset{2}{\cancel{20}}\right)\dfrac{7}{\cancel{10}}$$

$15A + 10 = 14$

$A = 4/15$

Use the LCM of the denominators to simplify before solving for the unknown.

17. $\dfrac{1}{2} + \dfrac{2}{3} = \dfrac{1}{4} X$

18. $\dfrac{3}{5} X + \dfrac{3}{4} = 1\dfrac{1}{2}$

19. $\dfrac{1}{9} X + \dfrac{2}{3} = \dfrac{1}{5}$

20. $\dfrac{3}{8} - \dfrac{1}{5} X = \dfrac{3}{4}$

SYSTEMATIC REVIEW

Solve for the unknown.

1. $Y - 3 = 10$

2. $2B - 5 = 13$

3. $3C + 6 = -9$

4. $2D - 5 = 1$

5. $4E - 3 = -3$

6. $3X + 8 = -2X - 2$

7. $2Y - 2 = 3Y - 6$

8. $Z + 8 = 2Z + 18$

Larger or smaller? (Use <, >, or = in the oval.)

9. $|3 \times 2 \times (-2)| \bigcirc 24 \div (-3)$

10. $|17 - 3 - 20| \bigcirc |7 + 0 + 1|$

Solve.

11. $[(6 - 2) \times 5^2 - 10] \div 5^2 =$

12. $(-7 - 6)^2 - (4 + 5 - 3)^2 =$

13. $\dfrac{5}{6} \times \dfrac{3}{7} \div \dfrac{2}{3} =$

14. How many groups of 12¢ are there in $1.68?

Use the answer to #15 to simplify #16, and then solve for X.

Hint: First make improper fractions.

15. Find the LCM of 2, 5, and 10.

16. $1\dfrac{1}{5}X + \dfrac{7}{10} = 2\dfrac{1}{2}X$

QUICK TIP

The LCM may also be used to simplify equations involving decimals.

EXAMPLE 1 Solve .05X − .35 = 2.7 If the decimals were written as fractions, the denominators would be 100 and 10. The LCM is 100.

Multiply each term by 100 → (100).05X − (100).35 = (100)2.7 → 5X − 35 = 270

X = 61

EXAMPLE 2 Solve .2X + 5 = 2.4

Multiply each term by 10 → (10).2X + (10)5 = (10)2.4

2X + 50 = 24 → X = −13

Use the LCM to make whole numbers before solving for the unknown.

17. .83 + .04X = .325

18. .18 + .2X = .17

19. .8X + 1.3 = 7 + .24

20. 8.2 − 4 = .08X