Summer Prep for Geometry 2020

RADICALS

Simplify.

1) \( \sqrt{2} \cdot 5\sqrt{8} \)  
2) \( 2\sqrt{2} \cdot \sqrt{4} \)

\[ \frac{20}{4\sqrt{2}} \]

3) \( \sqrt{15} \cdot \sqrt{3} \)  
4) \( \frac{5\sqrt{20}}{\sqrt{25}} \)

\[ \frac{3\sqrt{5}}{2\sqrt{5}} \]

5) \( \frac{\sqrt{20}}{\sqrt{125}} \)  
6) \( \frac{4\sqrt{4}}{4\sqrt{100}} \)

\[ \frac{2}{5} \]

7) \( \frac{\sqrt{2}}{5\sqrt{3}} \)  
8) \( \frac{3\sqrt{6}}{5\sqrt{10}} \)

\[ \frac{\sqrt{6}}{15} \]

9) \( \frac{\sqrt{5}}{3\sqrt{2}} \)  
10) \( -7\sqrt{8n^3} \)

\[ -\frac{14n\sqrt{2n}}{6} \]

11) \( -6\sqrt{147n^3} \)  
12) \( -4\sqrt{8m^2} \)

\[ -42n\sqrt{3n} \]

\[ -8m\sqrt{2} \]
Solve each equation. Remember to check for extraneous solutions.

13) \( \sqrt{35 - x} = \sqrt{\frac{x}{4}} \)

14) \( -6 + \sqrt{-6 - n} = -4 \)

\[ \{28\} \]

\[-10\]

SYSTEMS OF LINEAR EQUATIONS

Solve each system by graphing.

15) \( y = -2x - 1 \)
\( y = -\frac{1}{2}x + 2 \)

16) \( y = -5x - 2 \)
\( y = x + 4 \)

\((-2, 3)\)

\((-1, 3)\)

Solve each system by substitution.

17) \( -7x + y = 21 \)
\( 6x + 2y = -18 \)

18) \( 2x + 8y = 6 \)
\( 8x + y = 24 \)

\((-3, 0)\)

\((3, 0)\)

19) \( x + 2y = -14 \)
\( 8x - 5y = -7 \)

\((-4, -5)\)

Solve each system by elimination.

20) \( 9y = -9 + 9x \)
\( 0 = 3y - \frac{24}{5}x + \frac{78}{5} \)

21) \( -6y = 14 - 8x \)
\( \frac{1}{3} = -y - \frac{2}{3}x \)

\((7, 6)\)

\((1, -1)\)
22) \[-3x - 4y = 13\]
\[-9y + 21 + 10x = 0\]

\((-3, -1)\)

23) Anjali and Joe each improved their yards by planting grass sod and geraniums. They bought their supplies from the same store. Anjali spent $88.96 on 4 ft\(^2\) of grass sod and 8 geraniums. Joe spent $133.76 on 11 ft\(^2\) of grass sod and 4 geraniums. What is the cost of one ft\(^2\) of grass sod and the cost of one geranium?

ft\(^2\) of grass sod: $9.92, geranium: $6.16

24) The school that Asanji goes to is selling tickets to the annual talent show. On the first day of ticket sales the school sold 10 senior citizen tickets and 3 child tickets for a total of $130.80. The school took in $183.60 on the second day by selling 6 senior citizen tickets and 9 child tickets. Find the price of a senior citizen ticket and the price of a child ticket.

senior citizen ticket: $8.70, child ticket: $14.60

25) Jenny and Daniel are selling pies for a school fundraiser. Customers can buy blueberry pies and pumpkin pies. Jenny sold 7 blueberry pies and 1 pumpkin pie for a total of $56.10. Daniel sold 9 blueberry pies and 11 pumpkin pies for a total of $229.50. What is the cost each of one blueberry pie and one pumpkin pie?

blueberry pie: $5.70, pumpkin pie: $16.20

**POLYNOMIALS**

**Find each product.**

26) \(2b(4b + 4)\)

\[8b^2 + 8b\]

27) \(6v(7v - 8)\)

\[42v^2 - 48v\]

28) \(2p^2(3p + 2)\)

\[6p^3 + 4p^2\]

29) \((8n + 6)(n - 8)\)

\[8n^2 - 58n - 48\]
30) \((6a + 1)(5a - 1)\)  
\(30a^2 - a - 1\)  
31) \((3k + 4)(3k - 6)\)  
\(9k^2 - 6k - 24\)

32) \((3b - 1)(3b^2 + b - 2)\)  
\(9b^3 - 7b + 2\)  
33) \((3k + 1)(3k^2 - 5k - 4)\)  
\(9k^3 - 12k^2 - 17k - 4\)

34) \((2k - 4)(2k + 4)\)  
\(4k^2 - 16\)  
35) \((7a + 1)(7a - 1)\)  
\(49a^2 - 1\)

36) \((7x + 2)^2\)  
\(49x^2 + 28x + 4\)  
37) \((6m + 3)^2\)  
\(36m^2 + 36m + 9\)

**Factor the common factor out of each expression.**

38) \(-40mn^5 - 48n + 64\)  
\(8(-5mn^5 - 6n + 8)\)  
39) \(-24uv^6 - 24u^2v^3 - 3uv^2\)  
\(-3uv^2(8v^4 + 8uv + 1)\)

40) \(-7xy^2 + 6xy^4 - 4x^3y^5\)  
\(xy^2(-7 + 6y^2 - 4x^2y^3)\)

**Factor each completely.**

41) \(x^2 - 9\)  
\((x + 3)(x - 3)\)  
42) \(9a^2 - 25\)  
\((3a + 5)(3a - 5)\)
43) \(9x^2 + 30x + 25\)
\((3x + 5)^2\)

44) \(25n^2 + 30n + 9\)
\((5n + 3)^2\)

**QUADRATIC EQUATIONS**

Solve each equation by taking square roots.

45) \(-5x^2 = -80\)
\[
\{4, -4\}
\]

46) \(r^2 - 10 = 90\)
\[
\{10, -10\}
\]

Solve each equation by factoring.

47) \(b^2 = -3b + 10\)
\[
\{2, -5\}
\]

48) \(r^2 + 10r = -24\)
\[
\{-4, -6\}
\]

49) \(k^2 = -k + 20\)
\[
\{4, -5\}
\]

Solve each equation by completing the square.

50) \(p^2 - 20p - 26 = 0\)
\[
\{10 + 3\sqrt{14}, 10 - 3\sqrt{14}\}\]

51) \(n^2 - 20n + 99 = 0\)
\[
\{11, 9\}\]

52) \(k^2 - 14k - 100 = 0\)
\[
\{7 + \sqrt{149}, 7 - \sqrt{149}\}\]

Solve each equation with the quadratic formula.

53) \(8r^2 - 9r + 10 = 0\)
No solution.

54) \(n^2 - 10n - 119 = 0\)
\[
\{17, -7\}\]
55) \(7r^2 - 5r - 9 = 0\)
\[
\left\{ \frac{5 + \sqrt{277}}{14}, \frac{5 - \sqrt{277}}{14} \right\}
\]

Sketch the graph of each function.

56) \(y = x^2 + 8x + 20\)

57) \(y = -2x^2 + 16x - 33\)

58) \(y = x^2 + 4x + 5\)
PROPORTIONS

Solve each proportion.

59) \( \frac{3}{11} = \frac{p + 3}{p + 12} \)
   \[
   \begin{align*}
   \frac{3}{8} & \quad \text{or} \quad \frac{51}{4} \\
   \end{align*}
   \]

60) \( \frac{x + 6}{x + 9} = \frac{9}{5} \)
   \[
   \begin{align*}
   \left\{ -\frac{51}{4} \right\} \\
   \end{align*}
   \]

61) \( \frac{v - 12}{8} = \frac{v - 8}{12} \)
   \[
   \{20\} \\
   \]

62) \( \frac{3}{b + 2} = \frac{10}{b - 7} \)
   \[
   \begin{align*}
   \left\{ \frac{41}{7} \right\} & \quad \text{or} \quad \frac{41}{7} \\
   \end{align*}
   \]

Solve each equation. Remember to check for extraneous solutions.

63) \( \frac{2x^2 - 8}{x} = \frac{1}{x} + \frac{1}{2} \)
   \[
   \begin{align*}
   \left\{ \frac{9}{4}, -2 \right\} & \quad \text{or} \quad \frac{9}{4}, -2 \\
   \end{align*}
   \]

64) \( \frac{4}{5} = \frac{1}{n^2} - \frac{1}{5n} \)
   \[
   \begin{align*}
   \left\{ \frac{1}{5}, -\frac{5}{4} \right\} & \quad \text{or} \quad \frac{1}{5}, -\frac{5}{4} \\
   \end{align*}
   \]

65) \( \frac{r}{6} = \frac{1}{3r} - \frac{1}{6} \)
   \[
   \{1, -2\} \\
   \]