

PROBLEMS

ANSWERS

<p>Solve the following equations:</p> <p>1. $7 - 2(4x - 3) = 4$</p>	1.
<p>2. $\frac{3}{5}(2x - 3) + \frac{4}{5} = 5$</p>	2.
<p>3. $\frac{n+5}{6} + \frac{n-2}{12} = \frac{5}{24}$</p>	3.
<p>For problems 4 and 5, solve for the indicated variable.</p> <p>4. $mx + 3 = 4 - nx$ solve for x</p>	4.
<p>5. $\frac{a+c}{b} - \frac{d}{c} = \frac{a}{c}$ solve for b</p>	5.
<p>6. Solve the equation.</p> $\frac{3}{4} - r \left(r - \frac{1}{2} \right) = r(3 - r)$	6.
<p>7. $5.3 + 9.2x = 7.4x - 8.8$</p>	7.
<p>8. Find the volume of a ball with a radius of 6 inches. Use the formula $V = \frac{4}{3}\pi r^3$. Round to the nearest whole number.</p>	8.
<p>For problems 9 and 10, solve the inequality using interval notation and graph.</p> <p>9. $-5(2x - 4) \geq -6(2x - 4)$</p> <p style="text-align: center;"><i>graph</i></p> <hr style="width: 50%; margin-left: 0;"/>	9.

<p>10. $4y - 2 \geq 10$ or $4y - 2 \leq -10$</p> <p style="text-align: center;"><i>graph</i></p> <hr style="width: 50%; margin-left: 0;"/>	10.
<p>For problems 11- 13, solve the equation with absolute value.</p> <p>11. $3x - 1 - 2 = 6$</p>	11.
<p>12. $3x - 5 + 6 = 2$</p>	12.
<p>13. $4y - 3 = 3y + 10$</p>	13.
<p>For problems 14 and 15, solve the inequality with absolute value. Graph the solution and write the answer in set notation.</p> <p>14. $2x + 3 - 4 < 1$</p> <p style="text-align: center;"><i>graph</i></p> <hr style="width: 50%; margin-left: 0;"/>	14.
<p>15. $3x + 4 - 7 > 3$</p> <p style="text-align: center;"><i>graph</i></p> <hr style="width: 50%; margin-left: 0;"/>	15.
<p>16. $-2 \leq x - 5 < 7$</p> <p><i>graph</i> _____</p>	16.

graph:

1. $4x - 5y = 8$ **Use a "T" chart using 3 ordered pairs.**
2. $y = -\frac{5}{3}x + 6$ **Find the y intercept and count the slope.**
3. $2x - 5y > 10$ **Graph the line and shade the solution.**
4.
 - a. **Write the equation parallel to the line $f(x) = 3x - 4$ and passes through $(1, 5)$**
 - b. **Write the equation perpendicular to the line $f(x) = -\frac{5}{3}x + 6$ passing through $(0, 3)$**
5. **Find the slope of the line through $(-2, 5)$, $(3, 7)$**

For problems 6-8, write the equation for each of the following lines:

6. Slope is $\frac{4}{9}$; y-intercept is -13
7. Slope: $\frac{2}{5}$; through $(4, -8)$
8. Through the points $(-3, 6)$ and $(3, -2)$

Given: $f(x) = x^2 - 7x + 8$ $g(x) = 2x + 6$

Find:

9. $f(5)$
10. $g(-2)$
11. $f(3) - g(3)$
12. $g(5)$
13. **Find the slope of the line $y = -81$**

14. **Give the domain and the range for the following relation.**
 $\{(7, -3), (25, -10), (7, 3)\}$
 Is this a function?
15. **Use the vertical line test to determine if a graph represents a function.**
16. **Solve the system using the addition method.**

$$\begin{cases} 2x + 3y = -2 \\ 3x + 5y = -2 \end{cases}$$
17. **Solve the system using the substitution method.**

$$\begin{cases} y = 2x + 5 \\ 3x - 5y = -4 \end{cases}$$
18. **Solve the system by graphing.**

$$\begin{cases} y = 2x - 3 \\ 2x + y = 5 \end{cases}$$

answers:

1. through $(0, -\frac{8}{5}), (2, 0), (7, 4)$
2. through $(0, 6), (3, 1), (6, -4)$
3. dashed line through $(0, -2), (5, 0)$ shade to include $(0, -5)$
4. a. $f(x) = 3x + 2$
 b. $f(x) = \frac{3}{5}x + 3$
5. $\frac{2}{5}$
6. $y = \frac{4}{9}x - 13$
7. $y = \frac{2}{5}x - \frac{48}{5}$
8. $y = -\frac{4}{3}x + 2$
9. -2
10. 2
11. -16
12. 1
13. 0
14. domain $\{7, 25\}$
 range $\{-10, -3, 3\}$
15. See example pg. 153 of your text book.
16. $(-4, 2)$
17. $(-3, -1)$
18. The graph will meet at $(2, 1)$

Perform the indicated operations. Write answers with positive exponents.

$$1. \frac{18x^3y^2z}{27x^{-4}y^0z^3}$$

Perform the operations. Write in scientific notation.

$$2. \frac{0.00006 \times 12000}{0.003 \times 0.000004}$$

$$3. \frac{x+7}{2x^2+9x-35}$$

$$4. \frac{5ax-7a+5bx-7b}{3ax-2a+3bx-2b}$$

$$5. \frac{y^2-6y+9}{2y^2-18} \cdot \frac{4y+12}{5y-15}$$

$$6. \frac{2a^3+54}{5a^2+5a-30} \cdot \frac{6a+12}{3a^2-9a+27}$$

$$7. \frac{7x+28}{2x+4} \div \frac{x^2+2x-8}{x^2-2x-8}$$

$$8. \left(\frac{3a+2b}{2a^2+3ab} \right) \div \left(\frac{9a^2-4b^2}{2a^2+ab-3b^2} \cdot \frac{a-b}{3a^2b^2-2ab^3} \right)$$

$$9. \frac{16}{w-4} - \frac{4w}{w-4}$$

$$10. \frac{2}{x-3} - \frac{4}{x-1}$$

$$11. \frac{3}{x} + \frac{2x}{y}$$

2

$$12. \frac{2}{a^2 - 2a + 1} + \frac{3}{a^2 - 1}$$

$$13. \frac{7x+1}{x+3} - \frac{2x+3}{x-2}$$

$$14. \frac{\frac{y^2 + 5y - 6}{4y + 3}}{\frac{y^2 + 12y + 36}{8y + 6}}$$

$$15. \frac{\frac{2}{4-x} + \frac{3}{x-4}}{\frac{1}{x} + \frac{5}{x-4}}$$

$$16. \frac{1 - \frac{1}{x} - \frac{2}{x^2}}{1 + \frac{4}{x} + \frac{3}{x^2}}$$

For problems 17 & 18, solve the equation.

$$17. \frac{2m+3}{5m-9} = \frac{3}{2}$$

$$18. \frac{a-2}{a^2-7a+10} = \frac{1}{5a-10} - \frac{1}{a-5}$$

For Problems 19 & 20, divide.

$$19. \frac{24x^6y^7 - 12x^5y^{12} + 36xy}{48x^2y^3}$$

$$20. \frac{3x^3 - 2x^2 + x + 6}{x-1}$$

21. Solve applications problems such as #73 pg. 351
and #117, 119 pg. 441.

Answers

1. $\frac{2x^7y^2}{3z^2}$

2. 6×10^7

3. $\frac{1}{2x-5}$

4. $\frac{5x-7}{3x-2}$

5. $\frac{2}{5}$

6. $\frac{4(a+2)}{5(a-2)}$

7. $\frac{7(x-4)}{2(x-2)}$

8. b^2

9. -4

10. $\frac{-2x+10}{(x-1)(x-3)}$

11. $\frac{3y+2x^2}{xy}$

12. $\frac{5a-1}{(a-1)^2(a+1)}$

13. $\frac{5x^2-22x-11}{(x-2)(x+3)}$

14. $\frac{2(y-1)}{y+6}$

15. $\frac{x}{6x-4}$

16. $\frac{x-2}{x+3}$

17. 3

18. $\frac{5}{3}$

19. $\frac{x^4y^4}{2} - \frac{x^3y^9}{4} + \frac{3}{4xy^2}$

20. $3x^2 + x + 2 + \frac{8}{x-1}$

Perform the indicated operation and simplify. Write answers with positive exponents. Assume that all variables represent positive numbers.

1. $\sqrt[3]{125x^9y^3}$

2. $-\sqrt[3]{\frac{64a^3}{b^9}}$

3. $x^{\frac{5}{6}} \cdot x^{\frac{5}{7}}$

4.
$$\frac{(8a^4)^{\frac{1}{3}} \left(6a^{\frac{1}{3}}\right)}{6a^{\frac{1}{2}}}$$

5. $\sqrt{169a^{14}b^{22}c^4}$

6. $\sqrt[3]{-64x^{15}y^3z^{24}}$

7. $\left(4m^{\frac{2}{3}} + 5n\right)^2$

8. $4x^{\frac{5}{4}} \left(5x^{\frac{3}{4}} + x^{\frac{1}{4}}\right)$

For problems 9-11, use rational exponents to simplify each radical.

9.
$$\frac{\sqrt[5]{b^2}}{\sqrt[10]{b^3}}$$

10. $\sqrt[9]{a^3}$

.

11. $\sqrt[4]{5} \cdot \sqrt[3]{x}$

.

Perform the indicated operations; simplify; rationalize denominators:

12 $-\sqrt{128a^3b^5c^8}$

.

13 $\sqrt[3]{-108a^7b^{13}c^{10}}$

.

14 $\sqrt{\frac{7}{13x}}$

.

15 $\sqrt{\frac{19x^9y^2z^{-3}}{81x^{-5}y^3z^3}}$

.

16 $5\sqrt[3]{32x^4} - 2x\sqrt[3]{108x}$

.

17 $\sqrt{20} - \sqrt{245} + \sqrt{125}$

.

18 $(3\sqrt{x} - 2\sqrt{y})(3\sqrt{x} + 2\sqrt{y})$

.

19 $(6 - 7\sqrt{2a})^2$

.

20 $\frac{10u}{\sqrt{3u}}$

.

21 $\frac{4a}{\sqrt[3]{5}}$

.

22 $\frac{x^2 - x - 2}{\sqrt{x} - \sqrt{2}}$

.

23 $(5 - 3i) + 12 - 4(6 - 7i)$

.

24 $(8 + 3i)(6 - i)$

.

25 $(9 - 2i)^2$

.

26 $\frac{-15}{4i}$

.

$$27 \quad \frac{10i}{3-4i}$$

$$28 \quad i^{120}$$

$$29 \quad \sqrt{x+5} = x-1$$

$$30 \quad \sqrt[3]{2x+3} = -4$$

$$31 \quad \sqrt{x-3} = \sqrt{x+4} - 1$$

Answers:

$$1. \quad 5x^3y$$

$$2. \quad -\frac{4a}{b^3}$$

$$3. \quad \frac{65}{x^{42}}$$

$$4. \quad 2a^{\frac{7}{6}}$$

$$5. \quad 13a^7b^{11}c^2$$

$$6. \quad -4x^5yz^8$$

$$7. \quad 16m^{\frac{4}{3}} + 40m^{\frac{2}{3}}n + 25n^2$$

$$8. \quad 20x^2 + 4x^{\frac{3}{2}}$$

$$9. \quad \sqrt[10]{b}$$

$$10 \quad \sqrt[3]{a}$$

$$11 \quad \sqrt[12]{125x^4}$$

$$12 \quad -8ab^2c^4\sqrt{2ab}$$

$$13 \quad -3a^2b^4c^3\sqrt[3]{4abc}$$

$$14. \quad \frac{\sqrt{91x}}{13x}$$

$$15. \quad \frac{x^7}{9yz^3}\sqrt{19y}$$

$$16. \quad 4x\sqrt[3]{4x}$$

$$17. \quad 0$$

$$18. \quad 9x - 4y$$

$$19. \quad 36 - 84\sqrt{2a} + 98a$$

$$20. \quad \frac{10\sqrt{3u}}{3}$$

$$21. \quad \frac{4a\sqrt[3]{25}}{5}$$

$$22. \quad (x+1)(\sqrt{x} + \sqrt{2})$$

$$23. \quad -7 + 25i$$

$$24. \quad 51 + 10i$$

$$25. \quad 77 - 36i$$

$$26. \quad \frac{15i}{4}$$

$$30. \quad \frac{-67}{2}$$

$$31. \quad 12$$

PROBLEMS:

For problems 1-2, use the square root property to solve for the variable.

1. $5(x-2)^2 = 2$

2. $(m+3)^2 = -8$

Solve the equation by completing the square.

3. $5n^2 + 3n - 2 = 0$

4. $3p^2 + 12p = -14$

For problems 5-7, solve the equation by using the quadratic formula.

5. $\frac{1}{2}y^2 = y + \frac{1}{2}$

6. $(2x-3)^2 = x$

7. $x^2 + 4 = 0$

Use the discriminant to determine the number and type of solutions of the following equation.

8. $6 = 4x - 5x^2$

For problems 9-14, solve the equation with your choice of method.

9. $3 + \frac{1}{2p+4} = \frac{10}{(2p+4)^2}$

10. $x^{\frac{2}{3}} - 2x^{\frac{1}{3}} - 8 = 0$

11. $(m-6)^2 + 5(m-6) + 4 = 0$

12. $y^{-2} - 8y^{-1} + 7 = 0$

13. $x - \sqrt{3x} = 6$

14. $3m^3 - 81 = 0$

For problems 15-16, graph the solution set. Write the solution in interval notation.

15. $\frac{(4x+3)(x-5)}{x(x+6)} > 0$

16. $3y^2 + 10y \leq 8$

Solve the system by graphing.

17.
$$\begin{cases} 3x - 2y = -6 \\ 4x + y = 3 \end{cases}$$

18. *Solve problem #17 using the substitution method.*

19. **Graph**
 $f(x) = 3(x-1)^2 - 2$

20. **Solve**
 $|5x+2| < 8$