

"Practice is the best of all instructors." - Unknown

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1. Evaluate:

a.  $\left[\frac{7 - (-3)}{8 - 3}\right]^2 + \frac{4 + (-2)^3}{2 - 6}$

b.  $\frac{6(4 - 6)^2}{10 + 12 \div 4 + 4}$

c.  $\frac{3(4 - 8)}{-5} \div -\frac{7}{30}$

d.  $\frac{7 - (-3)}{8 - 6} \cdot \frac{3 + (-8)}{|2 - 7|}$

e.  $6^0 - 9^{-1} + 4^0 + 3^{-2}$

f.  $\left(-\frac{5}{2}\right)^{-3}$

2. Simplify:

a.  $\left(\frac{10p^3s}{-20q^3r^2}\right)^4$

b.  $(5t^3 \cdot 2t^6)^2$

c.  $(2c^6d^4)(cd^4)^5$

d.  $7x - 2(x - 3) - 6 + x$

e.  $12 - 4[2(5 - x) - 8x]$

f.  $2(x^2 \cdot x^3)^5$

g.  $\left(\frac{2x}{3y}\right)^4 \cdot \frac{3x}{2}$

h.  $\frac{(a + b)^9}{(a + b)^4}$

3. Simplify. You should have only positive exponents in your answer.

a.  $\frac{17k^{-8}h^5}{20m^{-7}n^{-2}}$

b.  $\left(\frac{2tu}{v}\right)^{-6}$

c.  $x^2 \left(\frac{1}{y}\right)^{-2}$

d.  $\frac{63a^{-2}b^2}{9a^7b^{10}}$

e.  $\left(\frac{k^7m^7}{12k^{-1}m^6}\right)^2$

4. Solve each equation for x. Check your answer.

a.  $\frac{5}{3}x + 6 = 41$

b.  $\frac{x}{8} - 1 = \frac{x}{3} - \frac{7}{12}$

c.  $A = P + PRx$

d.  $4x - (6x + 5) + 2 = 8x + 3(4 - 3x)$

5. Solve each inequality. State the answer in interval notation.

a.  $3 < 19 - 2j \leq 9$

b.  $7y + 2 > 37$  and  $5 - \frac{1}{3}y < 6$

c.  $a + 9 > 7$  or  $8a \leq -44$

6. Graph each equation by finding the intercepts and at least one other point:

a.  $x - \frac{5}{2} = 0$

b.  $6x - y = 7$

7. Write the slope-intercept form of the equation of the line, if possible, given the following information.

a.  $m = 7$  and contains  $(2, 5)$

b.  $m = -8$  and y-intercept  $(0, -1)$

c.  $m = -\frac{4}{9}$  and y-intercept  $(0, 2)$

d. contains  $(-6, -5)$  and  $(4, 10)$

e. contains  $(3, -6)$  and  $(-9, -2)$

f.  $m = \frac{1}{2}$  and contains  $(8, -3)$

g. horizontal line containing  $(1, 9)$

h. vertical line containing  $(4, 0)$

8. Determine if each pair of lines is parallel, perpendicular or neither.

a.  $y = -\frac{1}{2}x + 7$   
 $5x + 10y = 8$

b.  $4x - 6y = -3$   
 $-3x + 2y = -2$

c.  $y = 6$   
 $x = -2$

9. Write an equation of the line *parallel* to the given line and containing the given point. Write the answer in standard form, as indicated.

a.  $y = -3x + 1$ ; (5, -19)

b.  $x - 4y = 9$ ; (5, 3)

10. Write an equation of the line *perpendicular* to the given line and containing the given point. Write the answer in standard form.

a.  $4x - y = -3$ ; (-8, -3)

b.  $y = 6$ ; (-1, -3)

11. Without graphing, determine whether each system has no solution, one solution, or an infinite number of solutions.

a.  $x + 7y = -3$   
 $4x - 9y = 1$

b.  $15x - 10y = 4$   
 $-9x + 6y = 1$

c.  $5x - 4y = 2$   
 $y = \frac{5}{4}x - \frac{1}{2}$

12. Solve each system by substitution.

a.  $x + 8y = -2$   
 $2x + 11y = -9$

b.  $x + 8y = 2$   
 $x = 20 - 8y$

13. Solve each system using the elimination method.

a.  $6x - 4y = 12$   
 $15x - 10y = 30$

b.  $\frac{3}{4}x - y = \frac{1}{2}$   
 $-\frac{x}{3} + \frac{y}{2} = -\frac{1}{6}$

14. Solve the system by graphing:

$$\begin{aligned} 3x - y &= 2 \\ x + y &= 2 \end{aligned}$$

15. Perform the indicated operations, and simplify.

a.  $-\frac{3}{4}t^4(20t^3 + 8t^2 - 5t)$

b.  $4(-w^3 - 5w^2 + 3w + 7) - (3w^3 - 7w^2 + 12w + 19)$

c.  $(2x + 3y)(x - 6y)$

d.  $\left(\frac{2}{3}c^2 - 8\right)(6c^2 - 4c + 9)$

e.  $12x^2(2x + 5)(1 - x)$

f.  $(3r + 4)(r + 1)(r + 6)$

g.  $\left(\frac{4}{3} + z\right)\left(\frac{4}{3} - z\right)$

h.  $(7x + 2)^2$

i.  $5(y - 3)^2$

j.  $(a^2 - 7)^2$

k.  $(-3b^4 + 4b^2 - 6) + (2b^4 - 18b^2 + 4) + b^4 + 5b^2 - 2$

l.  $(-8u^2v^2 + 2uv + 3) - (-9u^2v^2 - 14uv + 18)$

m.  $21r^3 - 8r^2 + 3r + 2 + (-4r^2 + 5) - (6r^3 - r^2 - 4r)$

n.  $(x^2 - 10x - 6) - [(-8x^2 + 11x - 1) + (5x^2 - 9x - 3)]$

16. Divide.

a.  $\frac{24x^6y^6 - 54x^5y^4 - x^3y^3 + 13x^3y^3}{6x^2y}$

c.  $(10x^2 + 3x + 2x^3 - 20) \div (x + 4)$

e.  $(6t^2 - 43t - 20) \div (t - 8)$

g.  $\frac{x^4 - 1}{x + 1}$

b.  $(-45c^8d^6 - 20c^6d^5 + 60c^4d) \div (-60cd)$

d.  $(12a^4 - 19a^3 + 22a^2 - 9a - 20) \div (3a - 4)$

f.  $\frac{16w^2 - 3 - 7w + 15w^4 - 5w^3}{5w^2 + 7}$

h.  $\frac{3t^3 - 25t^2 + 14t - 2}{t - \frac{1}{3}}$

17. Factor completely.

a.  $2a^2 - 162$

b.  $5r^3 + 5$

c.  $-2x^2 + 8x - 8$

d.  $18a^2 + 12a$

e.  $4t^2 - 31t - 8$

f.  $a^3 - c^3$

g.  $4k^3 + 4k^2 - 3k$

h.  $2x^2 + 2x - xy - y$

i.  $c^2 + 8c + 9$

j.  $9w^2 + 3w - 15$

k.  $9m^2 + 16n^2$

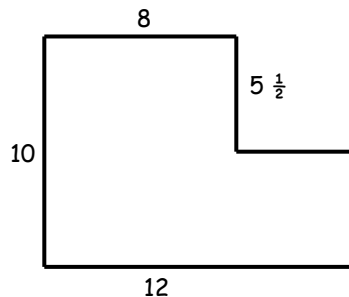
l.  $2ax - 6ay + 4bx - 12by$

m.  $21x^4y + 41x^3y + 10x^2y$

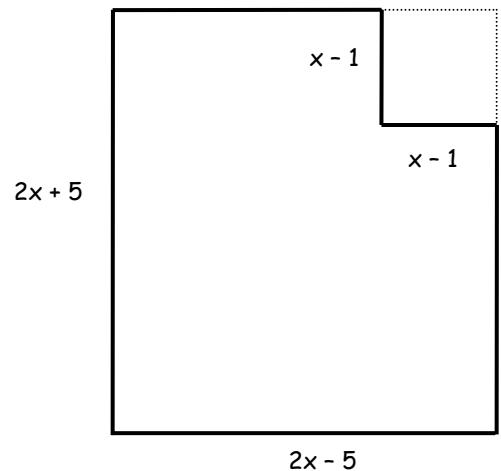
n.  $36b - b^3$

18. Find the volume of a cylinder with radius 2 inches and height 10 inches. Give your answer in terms of  $\pi$ . Be sure to include the correct units in your answer.

19. Find the perimeter and area of the shape below. All dimensions are in inches.



20. Find the area of the region enclosed by the solid lines.



21. A rectangle has a length of  $3w^2 - 2w + 4$ , and a height of  $w - 7$ . Find the perimeter and area of the rectangle.

22. The height of a triangle is  $4n$ . The area is  $6n^3 - 2n^2 + 10n$ . Find the base of the triangle.

23. The sum of two consecutive odd integers is 47 more than three times the larger integer. Find the integers.

24. Donna invests \$1500 in an account earning 4% interest and \$4000 in an account earning 6.7% interest. After 1 year, how much interest will she have earned?

25. For \$4.00 per month, Van can send or receive 200 text messages. Each additional message costs \$0.05. If Van can spend at most \$9.00 per month on text messages, find the greatest number he can send or receive each month.