

1. <sup>(6)</sup> A train travels at a rate of 123,200 yards per hour. How fast does the train travel in miles per hour? (Hint: A mile is equal to 1760 yards.)

**Simplify problems 5–11.**

5. <sup>(3)</sup>  $a^3 \cdot b^2 \cdot b^7 \cdot a^4 \cdot b^4$
6. <sup>(4)</sup>  $5^2 - 4 \div 2 + 6 \cdot (2)^3$
7. <sup>(9)</sup>  $-|9 - 4|$
8. <sup>(7)</sup>  $6 + 2[(5 - 3)^3 + 4]$
9. <sup>(11)</sup>  $4.5 + (-9)$
10. <sup>(15)</sup>  $-ab(bc^2 - a^2)$
11. <sup>(18)</sup>  $3x^3 + y^2 + 2x^3 + 3y^2$

3. <sup>(22)</sup> The stem-and-leaf plot shows the scores on a math test. Find the median score on the math test.

Stem	Leaf
5	8
6	3 7 9
7	0 0 3 7 8
8	0 1 2 4 8
9	1 5 8 8

4. <sup>(13)</sup> The area of a square rug is 225 square feet. What is the side length of the rug?

12. <sup>(29)</sup> Kate is knitting a 90-inch scarf at the rate of 8 inches per day. Write a rule in function notation to find the number of inches she has left to knit at the end of any given day. Let  $d$  represent the number of days spent knitting.

13. <sup>(14)</sup> There are 9 blue marbles, 2 red marbles, and 1 green marble in a bag. If a marble is randomly chosen, what is the probability that it is not blue?

14. <sup>(20)</sup> Complete the table for the equation  $y = 3x + 3$ .

x	y
-2	
0	
2	
2	

**Solve problems 15–18.**

15. <sup>(21)</sup>  $-6 = \frac{1}{3}x$

16. <sup>(23)</sup>  $\frac{1}{2}a - \frac{3}{4} = \frac{5}{6}$

17. <sup>(24)</sup>  $0.3r + 0.2 = 1.7$

18. <sup>(19)</sup>  $-13 = x + 6$

For problems 19–20, evaluate each expression for the given values of the variables.

19. <sup>(16)</sup>  $\frac{x(3yz)}{xz}$  for  $x = 4$ ,  $y = 3$ , and  $z = -2$ .

20. <sup>(9)</sup>  $2(m - n)^3 + 3m^2$  for  $m = 5$  and  $n = 2$ .

1.  $\frac{123,200 \text{ yd}}{1 \text{ hr}} \cdot \left( \frac{1 \text{ mi}}{1760 \text{ yd}} \right) = \frac{7 \text{ miles}}{1 \text{ hr}}$   
 $\frac{123,200 \text{ yd}}{1 \text{ hr}} \cdot \frac{1 \text{ mi}}{1760 \text{ yd}} = \frac{123,200}{1760} = 7 \text{ mph}$

6.  $5^2 - 4 \div 2 + 6 \cdot 2^3$   
 $25 - 4 \div 2 + 6 \cdot 8$   
 $25 - 2 + 48$   
 $23 + 48 = 71$

11.  $3x^3 + 4y^2 + 2x^3 + 3x^2$   
 $5x^3 + 4y^2$

16.  $\frac{1}{2}a - \frac{3}{5} = \frac{5}{6} \rightarrow \frac{10}{12}$   
 $\frac{1}{2}a = \frac{19}{12}$   
 $\frac{19}{12} \div \frac{1}{2} = \frac{19}{12} \cdot \frac{2}{1} = \frac{38}{12} = \frac{19}{6}$

2. Terms:  $7ab, 9c, \frac{12a}{5b}$

7.  $-|9-4|$   
 $-|5| = -5$

12.  $f(d) = 90 - 8d$

17.  $3r + 0.2 = 1.7$   
 $3r = 1.5$   
 $r = 0.5$   
 $1.5 \div 3 = 0.5$

3.  $\frac{78+80}{2} = \frac{158}{2} = 79$

8.  $6+2 \left[ (5-3)^3 + 4 \right]$   
 $6+2 \left[ 2^3 + 4 \right]$   
 $6+2 \left[ 8+4 \right]$   
 $6+2 \left[ 12 \right]$   
 $6+24 = 30$

13.  $9 \text{ blue} + 1 \text{ green} = 12 \text{ hzt}$   
 $\frac{9 \text{ blue}}{12 \text{ hzt}} + \frac{1 \text{ green}}{12 \text{ hzt}} = \frac{3}{12} = \frac{1}{4} \text{ or } 25\%$

18.  $-13 = x + 6$   
 $-19 = x$

4.  $\sqrt{225} = 15$

9.  $4.5 \div (-9) = -0.5$

14.  $y = 3x + 3$

x	y
-2	-3
0	3
2	9
$\frac{2}{3}$	5

$3(-2) + 3 = -6 + 3 = -3$   
 $3(0) + 3 = 0 + 3 = 3$   
 $3(2) + 3 = 6 + 3 = 9$   
 $3\left(\frac{2}{3}\right) + 3 = 2 + 3 = 5$

19.  $\frac{x(3yz)}{xz} = \frac{4(3 \cdot 3 \cdot 2)}{4 \cdot -2} = \frac{4(-18)}{-8} = 9$

$x = 4$   
 $y = 3$   
 $z = -2$

5.  $a^3 \cdot b^2 \cdot b^7 \cdot a^4 \cdot b^4 = a^{7+13} b^{2+7+4}$   
 $a^3 = 3+4$   
 $b^3 = 2+7+4$

10.  $-ab(bc^2 - a^2)$   
 $-abc^2 + a^2b$

15.  $-\frac{6}{1} = \frac{11}{3}x$   
 $-\frac{6}{1} \div \frac{11}{3} = -\frac{18}{11}$

20.  $2(m^n)^3 + 3m^2$   
 $2(5^2)^3 + 3(5)^2$   
 $2 \cdot 3^3 + 3(25)$   
 $(2 \cdot 27) + 75 = 129$

$m=5$   
 $n=2$