Algebra I Problem Set 31

Simplify each of the following expressions.

1a) $\sqrt{2}\sqrt{3}$ b) $\sqrt{3}\sqrt{7}$

2a) $\sqrt{5}\sqrt{6}$ b) $\sqrt{7}\sqrt{6}$

3a) $\sqrt{7}\sqrt{10}$ b) $\sqrt{3}\sqrt{5}$

4a) $\dfrac{\sqrt{15}}{\sqrt{3}}$ b) $\dfrac{\sqrt{15}}{\sqrt{5}}$

5a) $\dfrac{\sqrt{6}}{\sqrt{2}}$ b) $\dfrac{\sqrt{6}}{\sqrt{3}}$

6a) $\dfrac{\sqrt{21}}{\sqrt{3}}$ b) $\dfrac{\sqrt{21}}{\sqrt{7}}$

7. $3\sqrt{80}-2\sqrt{45}$

8. $2\sqrt{27}-4\sqrt{20}+\sqrt{45}-2\sqrt{12}$

9. x^3xx^4x

10. $7x^3y\left(-9y^3x^2\right)2^2x^2y$

Solve each equation for y and then graph the equation using the slope-intercept method.

11. $2x - 3y - 12 = 0$

12. $3x + 2y - 12 = 0$

13. $2x - 3y = 24$

14. Graph all three equations on the same set of axes:
    a) $y=-7$ b) $x = 5$ c) $y = x$

Evaluate the expression in problems 14–16 if $x=-3$. $y=\dfrac{2}{5}$ and z = 1.15:

15. x^2+10y

16. $\dfrac{15}{2}y-4z$

17. $|4x|+yz$

18. Find f(1) and f(5) if $f(x)=2(x-3)^2-5$

19. If $g(x)=x^3-|x|+3x$ find $g(3)$ and $g(-3)$

Simplify:

20. $3\left(2x^2-3x+5\right)-2\left(3+4x-x^2\right)$

21. $x(2x+3y-5)-y(3y-4x+2)$

22a) 3^4 b) -3^2 c) $(-4)^2$

23a) $\sqrt{169}$ b) $-\sqrt{81}$ c) $\sqrt{289}$

24a) $\dfrac{2\sqrt{64}-2^4}{|-5|+3}$ b) $\dfrac{2|-3|+\sqrt{16}}{-2^3+|-8|}$

Solve each equation:

25. $3x-4+5x+3=6-4x+7$

26. $4-3(5x-3)=6x+7$

27. $4(2x-5)+2=3-3(4-x)$

28. $1.3x-0.45=1.11$

29. $1\frac{2}{3}x-3\frac{2}{5}=2\frac{1}{2}$

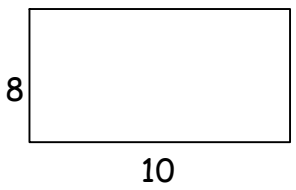
30. Fill in the missing data in the table as it relates to a rectangle.

Base	Height	Perimeter	Area
8	7		
9			45
	4	20	

Algebra I Problem Set 32

Find the perimeter and the area of each figure. All dimensions are in inches.

1.



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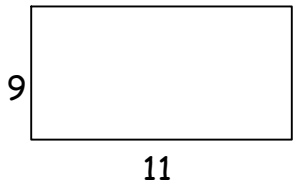

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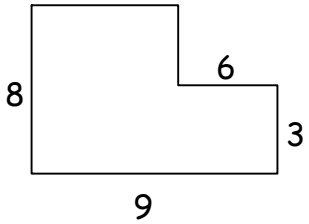

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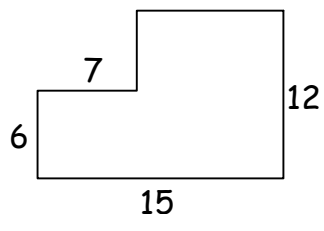

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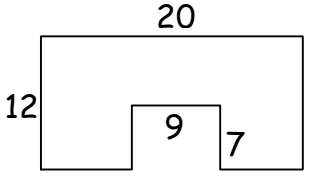

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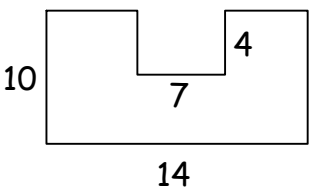


Simplify:

7. x^7x^4 8. $x^5y^4xx^2y^6$ 9. $x^4(-3x^4)(4x^4y^5)$

10. $(-5x^6)(3x^5)(-2x^3)$ 11. $6x^5(3y^4)(-3x)$ 12. $3m(-2m^2)(-m^3)$

Evaluate:

13. $2\sqrt{a} - x^4 + 2|3x - y|$ if a = 64, x = –2, and y = -4

14. If $f(x) = x^3 - 2x - 3$ find f(3) and f(–3)

Solve for y:

15. $3(2x - 4y) = -4(x - 2)$ 16. $-3(-2x + 3y - 4) = 4x + 7$ 17. $2(3 + 4x - 2y) = 4(y + 2x - 1)$

Graph each linear equation. Solve for y first, if necessary.

18. $8x + 4y = 24$

19a) $3x + 5y + 35 = 0$

b) $y = -7$

20a) $2x - 3y + 18 = 0$

b) $x = 2$

Solve:

21. $0.01x - 0.006 = 0.007x + 0.687$ 22. $0.5y - 1.04 = 0.02y - 0.08$

Simplify:

23a) $\dfrac{\sqrt{26 - 1^{10}}}{5 - |-5|}$

b) $\dfrac{8 - 4(2)}{3 + |5|}$

24a) $\sqrt{5}\sqrt{6}$

b) $\sqrt{7}\sqrt{10}$

25a) $\dfrac{\sqrt{130}}{\sqrt{10}}$

b) $\dfrac{\sqrt{85}}{\sqrt{5}}$

26. $8 - 4(2) + 2^4 - 5(3) - 1^5$ 27. $4\frac{4}{5} - 1\frac{7}{8}$ 28. $4\frac{4}{5} \div 1\frac{7}{8}$

29. Add the polynomials: $2(3x^2 - 5x + 4) - 4(2 - 3x + 2x^2)$

30. Add like terms: $8x^2 - 2y^2 + 3x^2y^2 + 7y^2 - 5y^2 - 4x^2$

Algebra I Problem Set 33

Graph the two lines and name their point of intersection.

1. $\begin{cases} y = x - 3 \\ y = -x + 5 \end{cases}$ 2. $\begin{cases} y = 2x - 1 \\ y = -3x + 4 \end{cases}$ 3. $\begin{cases} x + 3y = 0 \\ 2x - 3y + 18 = 0 \end{cases}$ 4. $\begin{cases} 2x - 4y = -12 \\ -x + 2y = -8 \end{cases}$

Simplify using the power rule for exponents:

5a) $(2x^3)^2$ 6a) $(-3m^3k^2)^2$ 7a) $\left(\frac{1}{2}xy^3\right)^2$ 8a) $(a^3b^5c^7)^8$

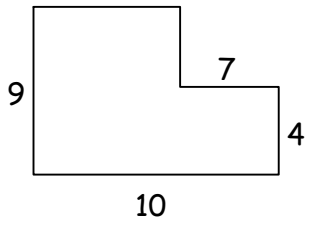
b) $(5x^4)^3$ b) $(k^4w^2z^5)^5$ b) $(4x^3k)^2$ b) $(4xy^3z^2)^3$

Simplify using both Product and Power rule for exponents:

9. $x^6y^3xx^5y^2$ 10. $(2c^3)(3c^2)$ 11. $(2c^3)^2(3c^2)^2$ 12. $(-2x^4y)(-3x^2)^2$

Find the perimeter and the area of each figure. All dimensions are in feet.

13.



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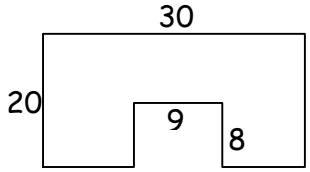


Solve the equations:

15. $3x - 6 = -36$ 16. $0.2d - 0.04 = 0.6$ 17. $\frac{3}{4}x - \frac{1}{2} = \frac{5}{8}$

18. $-x + 12 = -2$ 19. $3w - 4 = 5w + 6$ 20. $3g + 4g - 6 = 15$

21. $20 = 5h - 8h + 2$ 22. $3(k + 3) = 15$

23. Evaluate $|4m| - 3(m - k)$ if $m = -3$ and $k = -2$

24. Evaluate $4\sqrt{a} - h^3 + 3|a + h|$ if $a = 25$, $h = -2$

25. Add the polynomials: $-6(x^2 - 2x + 5) + 4(5 - 2x + 3x^2)$

26. Add like terms: $3x^2 - 5x^3 + 6x^3 + 5x^2 - 2x + 7x^3 - x$

Simplify:

27. $\sqrt{8}\sqrt{7}$ 28. $\frac{\sqrt{80}}{\sqrt{10}}$ 29. $\sqrt{180}$ 30. $\sqrt{50} - \sqrt{98}$

Algebra I Problem Set 34

Translate the sentence into a math equation and solve:

1. Four-fifths of what number is eighty?
2. Two-thirds of thirty is what number?
3. What fraction of forty-four is eleven?
4. One-fourth of what number is sixteen?
5. Two-fifths of sixty is what number?
6. What fraction of two-hundred is sixty?
7. Two percent of what number is twelve?
8. Twenty percent of sixteen is what number?
9. What percent of fifty is seven?
10. Six percent of what number is fifty-four?
11. What percent of twelve is three?
12. Sixty-three percent of fifty is what number?

Simplify using the rules for exponents:

13. $\left(8x^5\right)^2$
14. $\left(-6m^2k^8\right)^2$
15. $\left(4c^8\right)^2\left(2c^5\right)^3$
16. $\left(-5x^3y\right)\left(-2x^8\right)^2$

Solve the equation for y and then graph:

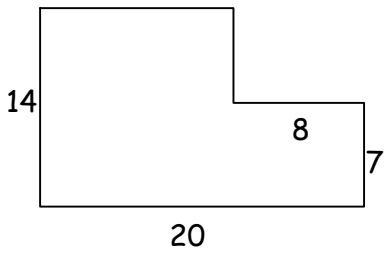
17. $2x - 8y - 16 = 0$
18. $x + y + 1 = 0$
19. $4x - y - 6 = 0$

Graph the two lines and name their point of intersection:

20. $\begin{cases} y = 3x - 1 \\ y = -2x + 4 \end{cases}$
21. $\begin{cases} 2x + 3y = 12 \\ 4x + 6y + 18 = 0 \end{cases}$
22. $\begin{cases} -x + 3y = 18 \\ -2x - 4y + 4 = 0 \end{cases}$

Find the perimeter and the area of each figure. All dimensions are in feet.

23.



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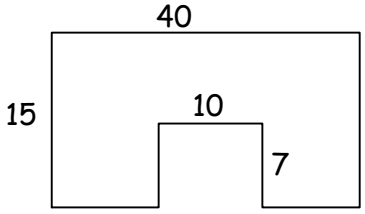


Simplify:

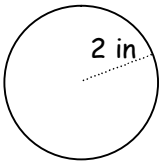
25. $\sqrt{90}$
26. $\sqrt{32} + 3\sqrt{12}$
27. $\sqrt{3}\sqrt{15}$
28. $\dfrac{\sqrt{80}}{\sqrt{10}}$

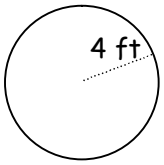
Solve:

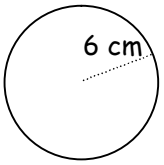
29. $3(5 - 2x) - 7 = 12 - 4(5x - 3)$
30. $1.2x - 2.13 = 0.07x + 0.469$

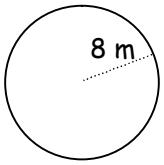
Algebra I Problem Set 35

Find the perimeter and the area of each circle.

1. 

2. 

3. 

4. 

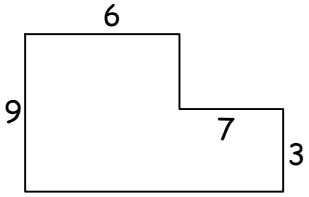
5. The perimeter of a circle is 10π cm. What is the circle's radius?

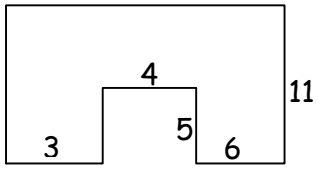
6. The perimeter of a circle is 16π ft. What is the circle's radius?

7. The area of a circle is 49π cm^2. What is the circle's radius?

8. The area of a circle is 81π m^2. What is the circle's radius?

Find the perimeter and the area of each figure. All dimensions are in inches.

9. 

10. 

Write an equation and solve:

11. Two-thirds of 48 is what number?

12. What fraction of 125 is 75?

13. Four-sevenths of what number is 48?

14. Fifteen percent of what number is 21?

15. What percent of 250 is 45?

16. Forty-two percent of 150 is what number?

Simplify:

17a) x^2x^3 b) $x^2yy^3x^4y^2$

18a) $(3x^3y^3)^4$ b) $(-2a^2b)^3$

19a) $(2x^2)^2\,(3y^3)^3$ b) $(-2xy^2)^3\,(-3x^2y^4)^2$

20. $(3a^3b)(-4ab^2)(-2ab^4)$

Solve:

21. $2(3x + 4) - 5 = 7 + 5(2x - 3)$

22. $3.1x - 0.06 = 0.5x + 10.6$

23. Solve for p:
$2(p + 3) + 4k = 5p - 3(2 + k)$

24. Solve for t:
$3t - 4(x + 2y) = 2(t - 4) + 5x$

Graph each pair of lines and name their point of intersection:

25. $\begin{cases} y = -\frac{1}{2}x \\ 6x + 3y + 27 = 0 \end{cases}$

26. $\begin{cases} y = \frac{1}{3}x - 4 \\ x - 3y = 18 \end{cases}$

27. $\begin{cases} x = -4 \\ 6x - 2y + 12 = 0 \end{cases}$

Evaluate:

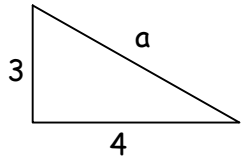
28. $|-3x| - \sqrt{xy} + y^2$ if $x = -3$ and $y = -12$

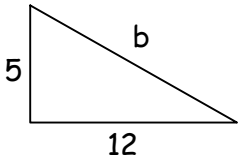
29. Add: $3(x^2 - 4x + 5) - 2(6 + 3x - 2x^2)$

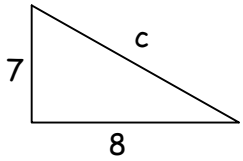
30. Simplify: $\sqrt{72} + \sqrt{8}\sqrt{6} - \frac{\sqrt{180}}{\sqrt{10}}$

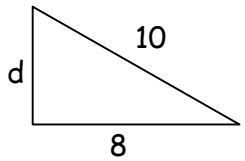
Algebra I Problem Set 36

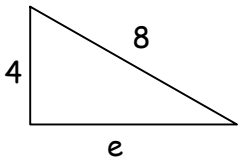
Find the length of the missing side of each triangle.

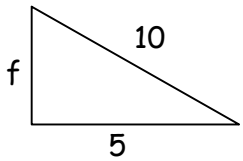
1. 

2. 

3. 

4. 

5. 

6. 

7. Find the perimeter and the area of a circle that has a radius of 6 inches.

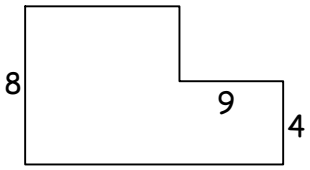
8. Find the perimeter and the area of a circle that has a radius of 5 centimeters.

9. The perimeter of a circle is 24π centimeters. What is the circle's radius?

10. The area of a circle is 36π square meters. What is the circle's radius?

Find the perimeter and the area of each figure. All dimensions are in inches.

11.



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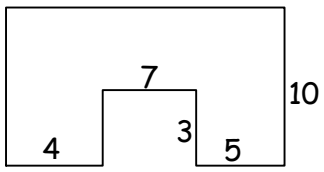


Write an equation and solve:

13. Twenty is what fraction of 12?

14. Twenty-four percent of what number is 12?

15. Thirty-six percent of 75 is what number?

Simplify:

16. $(2a^2b^3)(-4ab^4)$

17. $(-3ab^3)^2\left(a^2b\right)^3$

18. $\sqrt{98}-\sqrt{128}$

19a) $-3\sqrt{5}\cdot 4\sqrt{10}$

b) $\dfrac{5\sqrt{40}}{2\sqrt{5}}$

Graph each pair of lines and name their point of intersection:

20. $\begin{cases} 2x+3y=-12 \\ 2x-3y=24 \end{cases}$

21. $\begin{cases} y=5 \\ 4x+2y=-2 \end{cases}$

22. Evaluate: $x^2+3|xy|+\sqrt{12y}$ if $x=-2$ and $y=3$

Solve each equation:

23. $2\frac{1}{3}x-\frac{5}{8}=1\frac{1}{2}$

24. $5-2(3y-4)=4(-5y-3)+7$

25. $1.3z+3.05=1.118-0.8z$

26. Find f(2) and f(6) if $f(x)=x^2-8x+10$

27. Add like terms: $3x^2y-4yx^2+6xy^2-7y^2x+5xy$

Simplify:

28. $4(5-3x+2x^2)-2(3x^2-4x+7)$

29a) $\dfrac{2(3-5)+|-4|}{-2^2+3}$

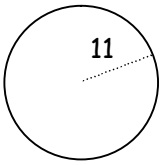
b) $\dfrac{\sqrt{49}+3^2}{|-9|-\sqrt{81}}$

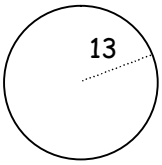
30a) $2\frac{3}{4}-4\frac{1}{2}$

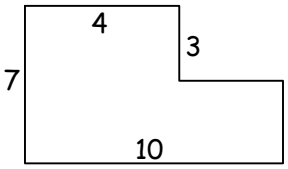
b) $2\frac{3}{4}\cdot 4\frac{1}{2}$

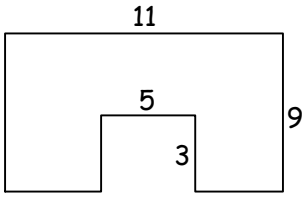
Algebra I Problem Set 37

Find the perimeter and the area of each figure. All dimensions are in centimeters.

1. 

2. 

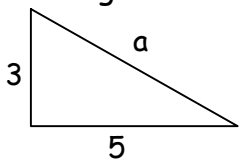
3. 

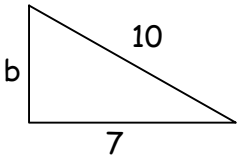
4. 

5. The perimeter of a circle is 24π cm. What is the circle's radius?

6. The area of a circle is 100π cm^2. What is the circle's radius?

Find the length of the missing side of each right triangle. Dimensions are given in inches.

7a) 

b) 

Write an equation and solve:

8. Three-eighths of 72 is what number?

9. What percent of 96 is 72?

10. Forty-eight percent of what number is 132?

Simplify:

11. $\dfrac{x^{12}}{x^7}$

12. $\dfrac{8z^{11}}{2z^5}$

13. $\dfrac{-6b^6c^8}{2b^3c^4}$

14. $\dfrac{x^9y^2}{4x^6y}$

15. $\dfrac{x^8y^2z^7}{x^5z^5}$

16. $\dfrac{\left(3x^2y^3\right)^2}{6x^3y^4}$

17. $(2x^2y)^3(2xy^3)^2$

18. $\dfrac{4x^2x^3y^4y^5}{\left(2xy^2\right)^3}$

19. $\dfrac{\left(4k^3m^4\right)^2}{2^2k^4m^5}$

20. $5\dfrac{2}{3}-3\dfrac{3}{4}$

21. $\dfrac{2}{3}\div\dfrac{3}{4}$

22. Solve for n: $3(a + 2n) - 7 = 8n + 5(a - 2b)$

23. Solve: $0.015 - 2.2x = 1.225$

Graph each pair of lines and name their point of intersection:

24. $\begin{cases} 2x-4y=28 \\ x-3y-18=0 \end{cases}$

25. $\begin{cases} y=6 \\ 4x-y=6 \end{cases}$

26. Evaluate: $\sqrt{ab} - b^2 - |3a|$ if $a = -12$ and $b = -3$

27. Find $f(2)$ and $f(-2)$ if $f(x) = x^2 - 5x - 14$

Simplify:

28a) $\sqrt{5} \cdot \sqrt{200} + \sqrt{250}$

b) $\dfrac{\sqrt{200}}{\sqrt{5}} - \sqrt{160}$

29. $\dfrac{9 + (2-6)^2 - 5^2}{\sqrt{49} - 4}$

30. $-2 + 6 - 7(4 + 2)$

Algebra I Problem Set 38

Multiply:

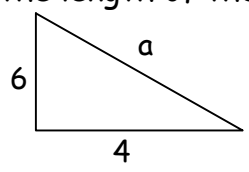
1. $5x(2x + 3)$
2. $-3x(x^2 + 2x - 1)$
3. $(2x + 3)(3x - 5)$
4. $(3x - 4)(2x - 5)$
5. $(4x + 1)(x + 4)$
6. $(5x - 3)(2x + 6)$
7. $(2x - 1)(3x^2 + 5x - 4)$
8. $(x + 6)(-2x^2 - 3x + 4)$
9. $(-3x + 2)(4x^2 + 3x - 2)$
10. $(x^2 + 2x + 1)(2x^2 - 3x + 4)$

Simplify:

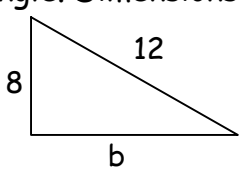
11. $-3^3 a^3 b^5 \left(-2a^2 b^3\right)^2$
12. $\dfrac{24r^8 s^7}{-6r^4 s^5}$
13. $\dfrac{-18x^4 y^3 z^7}{\left(3x^2 z^3\right)^2}$

Find the length of the missing side of each right triangle. Dimensions are given in feet.

14a)



b)



15. Fill in the table below as it applies to squares. All dimensions are in inches

Side	Perimeter	Area
3		
	32	
		36

16. Fill in the table below as it applies to rectangles. All dimensions are in inches

Base	Height	Perimeter	Area
8	3		
6		22	
	6		54

17. Fill in the table below as it applies to triangles. All dimensions are in inches

Base	Height	Area
3	8	
	8	16
5		25

18. Fill in the table below as it applies to circles. All dimensions are in inches

Radius	Perimeter	Area
3		
	8π	
		25π

19. Five-eights of what number is 45?

20. What percent of 80 is 44?

Graph each pair of lines and name their point of intersection:

21. $\begin{cases} 2x-3y=12 \\ 6x-3y=-12 \end{cases}$

22. $\begin{cases} 3x+4y=16 \\ 6x+16=-8y \end{cases}$

Solve:

23. $4(x-5)=-3(2x-6)$

24. $1.6x-0.98=0.1+0.7x$

25. $3(-2x+7)=2\left|-3+(-2)^3\right|$

26. $12-3(5-2x)+5=2(5x-3)-8$

Simplify:

27. $-3+5-4-8+3+7$

28. $\frac{2}{3}+\frac{1}{4}-\frac{5}{6}$

29. $6\frac{5}{6}-4\frac{7}{8}$

30. $7.007-3.03$

Algebra I Problem Set 39

Find the Greatest Common Factor (GCF):

1a) 16 and 20 b) 36 and 54

2a) $4xy$ and $12x$ b) $3x^2y^2$ and $15x^2y$

Factor:

3a) $4h^3+2h^2-14h^4$ b) $6xd^2+12x^2d^2-24x^3d^2$

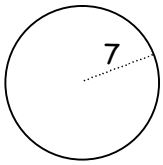
4a) $5x^2z^2+10xz^2-35x^2z^3$ b) $12m^4k^3+8m^2k^5-28m^3k^4$

Simplify:

5. $\dfrac{12z^{10}}{3z^4}$ 6. $\dfrac{-15g^3p^5}{-3g^3p^3}$ 7. $\dfrac{\left(-2a^4b^6\right)^3}{\left(4a^3b^2\right)^2}$ 8. $(4x^5y)^2(x^7y^4)^3$

Find the perimeter and the area of each figure. Dimensions are in inches.

9.



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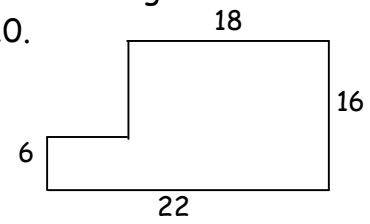

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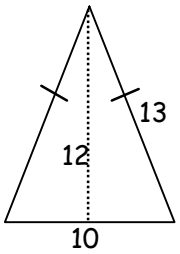
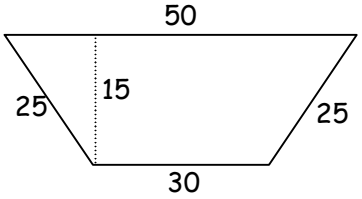


Find the perimeter and the area of each figure. Dimensions are in centimeters.

12.



13.

14. The perimeter of a circle is 24π cm. What is the circle's radius and area?

15. The area of a circle is 25π cm^2. What is the circle's radius and perimeter?

16. What fraction of one hundred is thirty?

17. One-eighth of what number is ten?

18. Sixty-two percent of 150 is what number?

19. What percent of 200 is 88?

20. Evaluate: $|-x|+4\sqrt{y}+x^3$ if $x=-4$ and $y=25$

21. Add: $8(3x^3-2x^2-x+7)-6(4+4x-6x^2-5x^3)$

Solve:

22. $-(2x + 5) = -16 + 3(5x - 2)$

23. $\frac{1}{2}x + \frac{3}{4} = 1\frac{1}{3}$

Multiply:

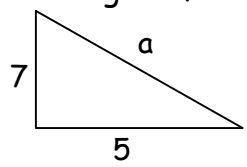
24. $5x(7 - 3x)$

25. $(4x - 5)(3x + 2)$

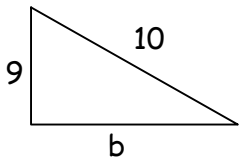
26. $(2x - 3)(3x^2 - 4x + 5)$

Find the length of the missing side of each right triangle. Dimensions are given in feet.

27a)



b)



28. Graph the lines and name their point of intersection: $\begin{cases} 4x - 2y = -12 \\ x + 4y + 12 = 0 \end{cases}$

Simplify:

29. $3\left(2\sqrt{3} - 5\sqrt{2}\right) - 4\left(3\sqrt{2} + 4\sqrt{3}\right)$

30. $2\sqrt{30}\sqrt{6} - \sqrt{245}$

Algebra I Problem Set 40

Solve the proportions:

1. $\frac{3}{4} = \frac{x}{12}$

2. $\frac{2}{k} = \frac{10}{25}$

3. $\frac{5}{9} = \frac{x}{10}$

4. $\frac{1}{k} = \frac{15}{16}$

5a) $\frac{5}{8} = \frac{x+1}{16}$

b) $\frac{2}{5} = \frac{8}{d-2}$

6a) $\frac{1}{k+3} = \frac{5}{35}$

b) $\frac{m-4}{3} = \frac{4}{12}$

Solve by graphing:

7. $\begin{cases} y = 2x - 5 \\ y = -x + 1 \end{cases}$

8. $\begin{cases} y = \frac{2}{3}x - 2 \\ y = -\frac{2}{3}x - 6 \end{cases}$

9. $\begin{cases} x + y = -2 \\ x - 5y + 20 = 0 \end{cases}$

Find the Greatest Common Factor (GCF):

10 12 and 24

11. $5x^2y$ and $20xy$

Factor:

12. $10h^4+6h^2-22h^7$

13. $24a^3b^2-6a^2b^2+12a^4b^3$

Simplify:

14a) $\frac{m^8}{m^{10}}$ b) $\frac{-27g^6p^7}{-9g^7p^9}$

15a) $\frac{\left(3x^6y^7\right)^2}{21xy^{20}}$ b) $\frac{\left(a^6b^2\right)^4}{\left(-2a^4b^6\right)^3}$

16. Find the perimeter and the area of a circle that has a radius of 10 inches.

17. The perimeter of a circle is 50π cm. What is the circle's radius and area?

18. One-third of what number is twenty?

19. Thirty-five percent of what number is twenty-eight?

20. If $f(x) = -2x^2-4x+2$, find (4) and $f(-2)$

21. Evaluate: $(-2-4)^2+\sqrt{100}-|2-17|+(-3)^3$

Add Like Terms:

22. $2x - 5y - 7y + 6x - x + 9y + 4x$

23. $3d^3w-wd^4+wd^3-6d^4w+10d^3w$

24. Solve for m: $3w + 7y - 2m = 4w - 8y - 6m$

25. Add the polynomials: $2\left(x^4-4x^2-1\right)-5\left(4+2x^2-4x^4\right)$

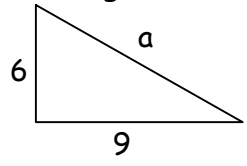
Multiply:

26. $(3x-5)(4x+7)$

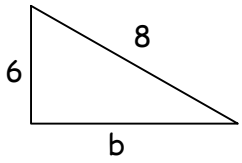
27. $(2x+3)\left(x^2-4x+5\right)$

Find the length of the missing side of each right triangle. Dimensions are given in centimeters.

28.



29.



30. Solve: $4\left(x-2^2\right)-\sqrt{25}=7x-5+2\cdot3$