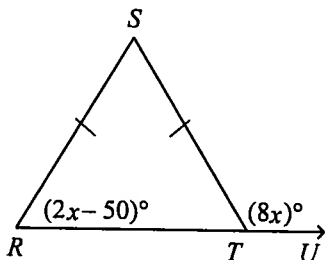


Prereq skills unit 2 exam review

Short Answer

1. Write out the equation you would use. Find the value of  $x$ . The diagram is not to scale.

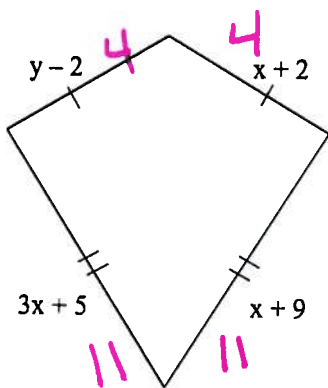


$$2x - 50 + 8x = 180$$

$$10x = 230$$

$$x = 23$$

2. Write out the equation you would use. Find the values of the variables and the lengths of the sides of this kite.



$$y - 2 = x + 2$$

$$3x + 5 = x + 9$$

$$\begin{array}{r} 3x + 5 = x + 9 \\ -x \quad -5 \quad -x \quad -5 \\ \hline 2x = 4 \end{array}$$

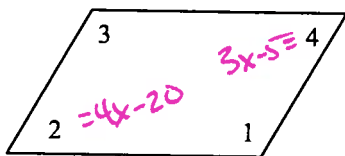
$$x = 2$$

$$y - 2 = 4$$

$$y = 6$$

4, 4, 11, 11

3. For the parallelogram, if  $m\angle 2 = 4x - 20$  and  $m\angle 4 = 3x - 5$ , find  $m\angle 1$ . The diagram is not to scale.



$$4x - 20 = 3x - 5$$

$$x = 15$$

$$4(15) - 20$$

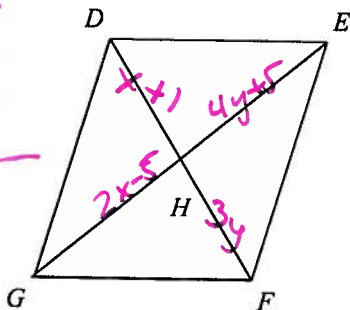
$$60 - 20 = 40$$

$$m\angle 1 + m\angle 2 = 180$$

$$m\angle 1 + 40 = 180$$

$$m\angle 1 = 140^\circ$$

4. In parallelogram  $DEFG$ ,  $DH = x + 1$ ,  $HF = 3y$ ,  $GH = 2x - 5$ , and  $HE = 4y + 5$ . Find the values of  $x$  and  $y$ . The diagram is not to scale.



$$x = 17$$

$$y = 6$$

$$x + 1 = 3y \rightarrow x = 3y - 1$$

$$2x - 5 = 4y + 5$$

$$2(3y - 1) - 5 = 4y + 5$$

$$6y - 2 - 5 = 4y + 5$$

$$6y - 7 = 4y + 5$$

$$2y = 12$$

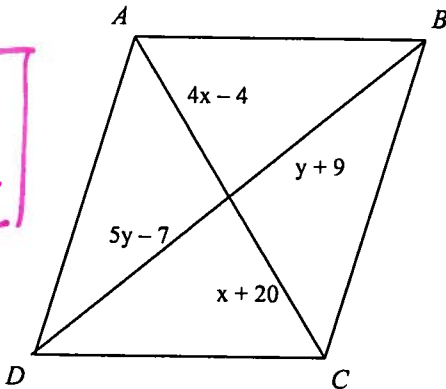
$$y = 6$$

$$x = 3(6) - 1$$

$$x = 18 - 1$$

$$x = 17$$

5. Find values of  $x$  and  $y$  for which  $ABCD$  must be a parallelogram. The diagram is not to scale.

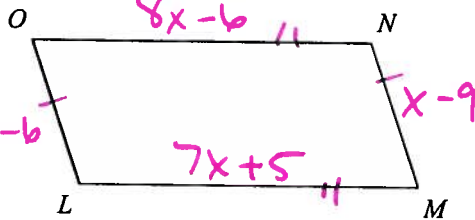


$x=8$   
 $y=4$

$$\begin{array}{r} 4x - y = x + 20 \\ -x + 4 \quad -x + 4 \\ \hline 3x = 24 \\ x = 8 \end{array}$$

$$\begin{array}{r} 5y - 7 = y + 9 \\ -y + 7 \quad -y + 7 \\ \hline 4y = 16 \\ y = 4 \end{array}$$

6. If  $ON = 8x - 6$ ,  $LM = 7x + 5$ ,  $NM = x - 9$ , and  $OL = 4y - 6$ , find the values of  $x$  and  $y$  for which  $LMNO$  must be a parallelogram. The diagram is not to scale.



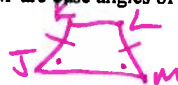
$x=11$   
 $y=2$

$$\begin{array}{r} 8x - 6 = 7x + 5 \\ -7x + 6 \quad -7x + 6 \\ \hline x = 11 \end{array}$$

$$\begin{array}{r} 4y - 6 = x - 9 \\ 4y - 6 = 11 - 9 \\ 4y - 6 = 2 \\ 4y = 8 \\ y = 2 \end{array}$$

7.  $\angle J$  and  $\angle M$  are base angles of isosceles trapezoid  $JKLM$ . If  $m\angle J = 18x + 3$ , and  $m\angle M = 10x + 11$ , find  $m\angle K$ .

$m\angle K = 159^\circ$



$$\begin{array}{r} 18x + 3 = 10x + 11 \\ 8x = 8 \quad x = 1 \\ m\angle M = 10(1) + 11 = 21 \\ m\angle J + m\angle M = 180 \end{array}$$

$21 + m\angle K = 180 \rightarrow 159$

8. One side of a kite is 9 cm less than four times the length of another side. The perimeter of the kite is 56 cm. Find the lengths of the sides of the kite.

Challenge

$4x - 9, x$

$x + x + 4x - 4x - 9 = 56$

$10x - 18 = 56$

$x = 7.4$

9. Evaluate  $u + xy$ , for  $u = 9$ ,  $x = 8$ , and  $y = 2$ .

$9 + 8(2) = 9 + 16 = 25$

$10x = 74$

$7.4, 7.4, 20.6, 20.6$

10. Evaluate the expression  $(ab)^2$  for  $a = 6$  and  $b = 4$ .

$(24)^2 = 576$

11. Evaluate  $x(-y + z)$  for  $x = -3$ ,  $y = 4$ , and  $z = -1$ .

$3(-4 + -1) = 3(-5) = -15$

12. Solve for  $x$ .  $-6 = \frac{x}{8} + 4$

$-10 = \frac{x}{8} \quad x = -80$

13. Solve for  $x$ .  $\frac{4}{9}x + 4 = 7$

$\frac{4}{9}x = 3 \quad 4x = 27 \quad x = \frac{27}{4} = 6.75$

14. Segment  $PA$  is 2 times the length of segment  $DY$ . If  $PA = y - 6$  and  $DY = 4$ , what is the value of the variable  $y$ ?

$PA = 2DY$   
 $y - 6 = 2(4)$   
 $y - 6 = 8$   
 $y = 14$

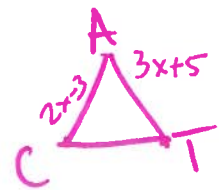
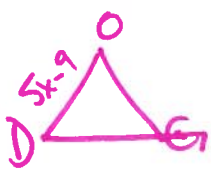
15. Solve for  $p$ .  $3p - 1 = 5(p - 1) - 2(7 - 2p)$

$3p - 1 = 5p - 5 - 14 + 2p$

$3p - 1 = 7p - 19$   
 $-3p + 18 = -3p + 14$

$18 = 4p$   
 $p = \frac{18}{4} = 4.5$

16.  $\triangle DOG \cong \triangle CAT$   
 $DO = 5x - 9$ ,  $AT = 3x + 15$ ,  $CA = 2x - 3$   
What is the length of segment  $AT$ ?



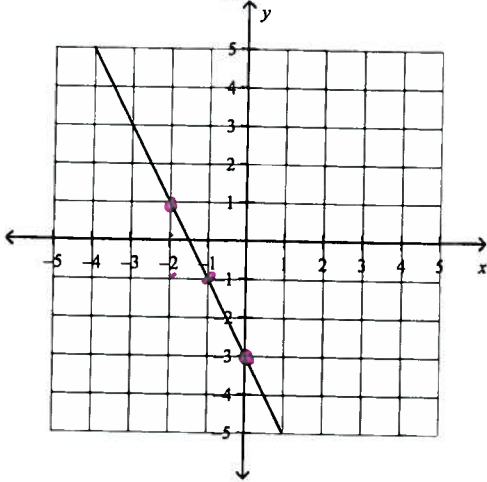
$5x - 9 = 2x - 3$   
 $3x = 6$   
 $x = 2$

$3(2) + 15$   
 $6 + 15 = 21$

17. Simplify  $\sqrt{\frac{81}{121}}$ . =  $\frac{9}{11}$

18. Simplify  $-\sqrt{2500}$ . =  $-50$

19. Write the equation of the line.



2500  
100<sup>2</sup> 25<sup>2</sup>  
(10)<sup>2</sup> (5)<sup>2</sup>

$y = mx + b$   
 $y = \frac{2}{1}x - 3$   
 $y = -2x - 3$

20. Find the slope and the y-intercept.  $y = \frac{2}{5}x - 1$

21. Find the slope and the y-intercept.  $20x + 6y = 18$

22. Write the equation of the line.  $(4, -6); m = \frac{3}{5}$

23. A line passes through  $(6, -4)$  and  $(7, 5)$ .  
a. Write an equation for the line in point-slope form.  
b. Rewrite the equation in standard form using integers.

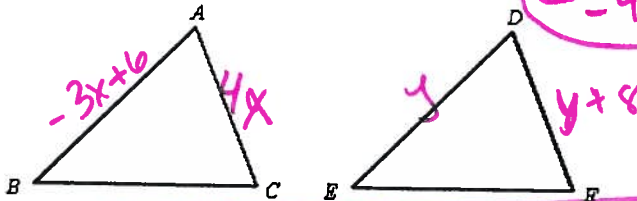
24. Solve for x and y.  $\triangle ABC \cong \triangle DEF$   
 $AB = -3x + 6$ ,  $DE = y$ ,  $AC = 4x$ ,  $DF = y + 8$

$m = \frac{2}{5}$   
 $y \text{ int} = y = 1 \text{ or } (0, -1)$

$20x + 6y = 18$   
 $\frac{6y}{6} = -\frac{20x}{6} + \frac{18}{6}$   
 $y = -\frac{10}{3}x + 3$

$y \text{ int @ } (0, 3)$   
Slope:  $-\frac{10}{3}$

$x = 2$   
 $y = 0$



$\frac{5+4}{7-6} = 9$   
a)  $y+4 = 9(x-6)$   
or  $y-5 = 9(x-7)$   
b)  $-9x + y = -58$

$y-5 = 9x-63$   
 $+5 \quad +5$   
 $y = 9x-58$

$-3x + 6 = y$   
 $4x = y + 8$

$-3x + 6 = 4x - 8$   
 $14 = 7x$   
 $x = 2$

$x = -4$   
 $y = -1$

25. Solve for the variables.  
 $5x = -18 + 2y$   
 $8y = -4 + x$   
 $x = 8y + 4$

$5(8y+4) = -18+2y$   
 $40y+20 = -18+2y$   
 $38y = -38$   
 $y = -1$   
 $x = 8(-1)+4$   
 $x = -8+4$   
 $x = -4$

$y = 4x - 8$   
 $y = 4(2) - 8$   
 $y = 0$

26. Solve for z.  $z^2 - 10z + 25 = 0$

$z = 5$

$(z-5)(z-5) = 0$

$x = -\frac{1}{3}$   
 $x = -1$

27. Solve for z.  $3z^2 + 4z + 1 = 0$

$x = \frac{-4 \pm \sqrt{16 - 4(3)(1)}}{2(3)}$

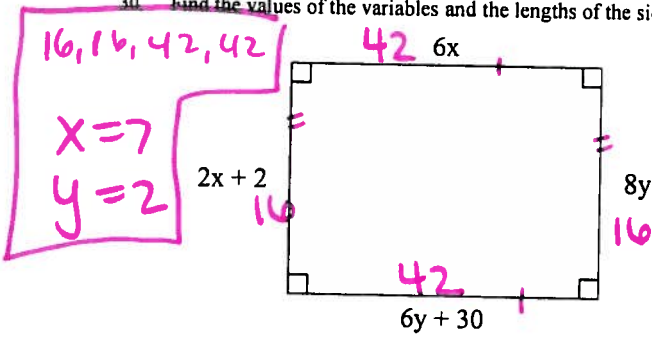
$\Rightarrow x = \frac{-4 \pm \sqrt{4}}{6} = \frac{-4 \pm 2}{6}$   
 $\rightarrow \frac{-4+2}{6} = -\frac{2}{6} = -\frac{1}{3}$   
 $\rightarrow \frac{-4-2}{6} = -\frac{6}{6} = -1$

28. Simplify.  $2\sqrt{8}$

$2 \cdot 2\sqrt{2}$   
 $4\sqrt{2}$

29. Simplify.  $\sqrt{\frac{21}{121}}$   $\frac{\sqrt{21}}{11}$

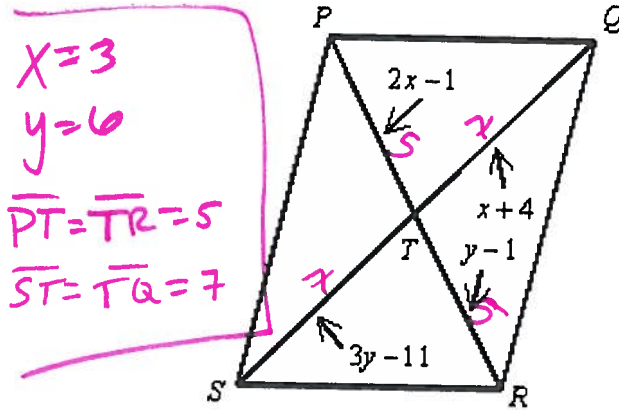
30. Find the values of the variables and the lengths of the sides of this rectangle. The diagram is not to scale.



$$\begin{aligned} 6x &= 6y + 30 \\ 8y &= 2x + 2 \\ 4y &= x + 1 \\ x &= 4y - 1 \\ x &= 4(2) - 1 \\ x &= 7 \end{aligned}$$

$$\begin{aligned} 6(4y - 1) &= 6y + 30 \\ 24y - 6 &= 6y + 30 \\ -4y + 6 &= 6y + 30 \\ +18y &= 36 \\ y &= 2 \end{aligned}$$

31. For parallelogram PQRS, find the values of x and y. Then find PT, TR, ST, and TQ. The diagram is not to scale.



$x=3$   
 $y=6$   
 $\overline{PT} = \overline{TR} = 5$   
 $\overline{ST} = \overline{TQ} = 7$

$$2x - 1 = y - 1 \rightarrow y = 2x$$

$$3y - 11 = x + 4$$

$$3(2x) - 11 = x + 4$$

$$\begin{aligned} 6x - 11 &= x + 4 \\ -x + 11 &= x + 4 \end{aligned}$$

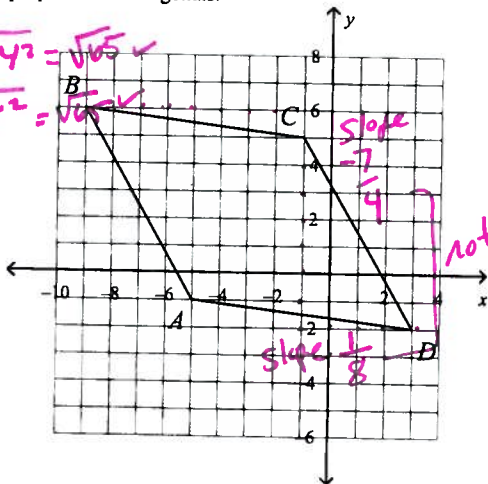
$$\begin{aligned} 5x &= 15 \\ x &= 3 \end{aligned}$$

$$\begin{aligned} y &= 2(3) \\ y &= 6 \end{aligned}$$

Essay

32. Verify that quadrilateral ABCD with vertices A(-5, -1), B(-9, 6), C(-1, 5), and D(3, -2) is a rhombus by showing that it is a parallelogram with perpendicular diagonals.

Length  
 $AB = \sqrt{7^2 + 4^2} = \sqrt{65}$   
 $BC = \sqrt{1^2 + 8^2} = \sqrt{65}$



Mdpt of diagonals

mdpt  $\overline{BD}$  : (-3, 2)

mdpt  $\overline{CA}$  : (-3, 2)

diagonals bisect each other  
 $\therefore$  parallelogram  
Rhombus  
square  
rect

Slope of  $\overline{AC}$  :  $\frac{-1-5}{-5-1} = \frac{-6}{-4} = \frac{3}{2}$

Slope of  $\overline{BD}$  :  $\frac{6+2}{-9-3} = \frac{8}{-12} = -\frac{2}{3}$

Opposite Reciprocal Diagonals

A parallelogram with diagonals that bisect and are perpendicular is a rhombus.