

Geometry  
Ch. 6 Review

Name: Answer Key Block: \_\_\_\_\_

**Section 6.1**

1. True or False.

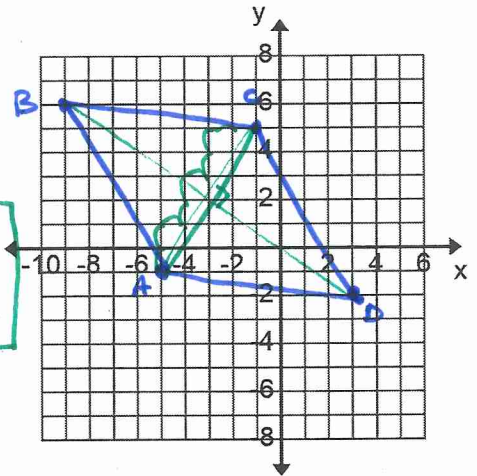
- a. A square is a rhombus. T
- b. A trapezoid is a parallelogram. F
- c. A rectangle is a parallelogram. T
- d. The diagonals of a rhombus are congruent. T
- e. A parallelogram has four right angles. F
- f. The diagonals of a kite are perpendicular. T

2. Use slopes and side lengths to give the most precise name for the quadrilateral with vertices at A(-5, -1), B(-9, 6), C(-1, 5), and D(3, -2).

$$m = \frac{-2 - 6}{3 - (-9)} = \frac{-8}{12} = -\frac{2}{3} \text{ BD}$$

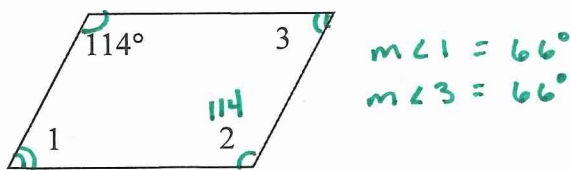
$$m = \frac{-1 - 5}{-5 - (-1)} = \frac{-6}{-4} = \frac{3}{2} \text{ AC}$$

$BD \perp AC$   
 $\therefore ABCD \text{ is a rhombus.}$

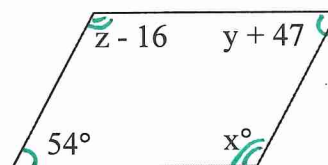


**Section 6.2**

3. Find the measures of the numbered angles for the parallelogram.

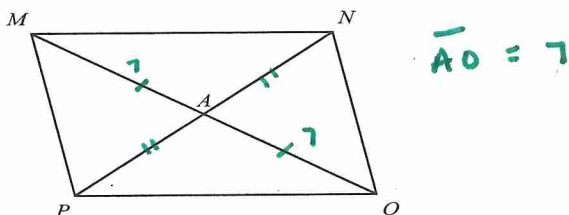


4. Find the value of each variable for the parallelogram.

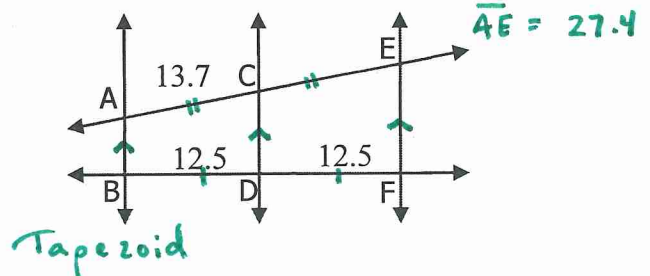


$y + 47 = 56$   
 $y = 9$   
 $x + 54 = 180$   
 $x = 126$   
 $z - 16 = 126$   
 $z = 142$

5. In parallelogram MNOP, AM = 7 and PN = 12. Find AO.

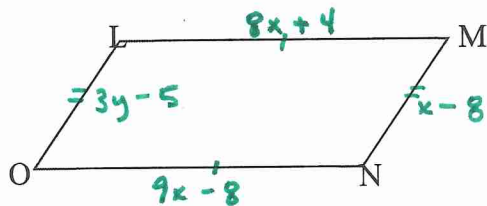


6. In the figure below,  $\overline{AB} \parallel \overline{CD} \parallel \overline{EF}$ . Find AE.



### Section 6.3

7. If  $ON = 9x - 8$ ,  $LM = 8x + 4$ ,  $NM = x - 8$ , and  $OL = 3y - 5$ , find the values of  $x$  and  $y$  for which  $LMNO$  must be a parallelogram.



$$9x - 8 = 8x + 4$$

$$-8x$$

$$x - 8 = 4$$

$$\boxed{x = 12}$$

$$3y - 5 = 12 - 8$$

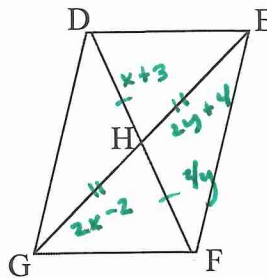
$$3y - 5 = 4$$

$$+5$$

$$\frac{3y}{3} = \frac{9}{3}$$

$$\boxed{y = 3}$$

8. If  $DH = x + 3$ ,  $HF = 4y$ ,  $GH = 2x - 2$ , and  $HE = 2y + 4$ , find the values of  $x$  and  $y$  for which  $DEFG$  must be a parallelogram.



$$\frac{4y}{4} = \frac{x+3}{4}$$

$$y = \frac{1}{4}x + \frac{3}{4}$$

$$2x - 2 = 2\left(\frac{1}{4}x + \frac{3}{4}\right) + 4$$

$$2x - 2 = \frac{1}{2}x + \frac{6}{4} + 4$$

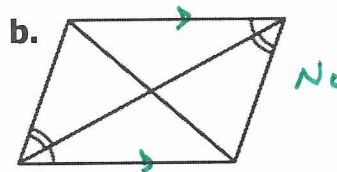
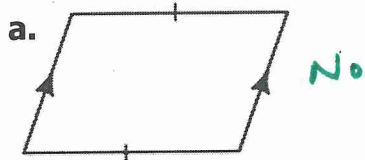
$$2x - 2 = \frac{1}{2}x + \frac{11}{4} \quad 8 = 4y$$

$$\frac{3}{2}x = \frac{15}{2}$$

$$\boxed{x = 5}$$

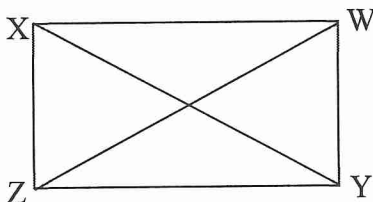
$$\boxed{y = 2}$$

9. With the given information, can you determine that each of the following quadrilaterals is a parallelogram? Explain how you know.



### Section 6.4

10.  $XWYZ$  is a rectangle.  $XY = 6x - 3$  and  $WZ = 3x + 12$ . Find the value of  $x$  and the length of each diagonal.



$$6x - 3 = 3x + 12$$

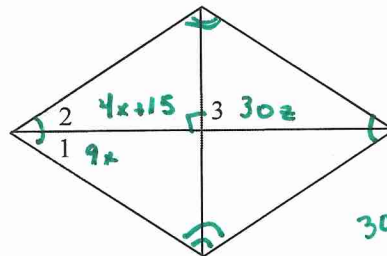
$$3x = 15$$

$$x = 5$$

$$XY = 30 - 3 = 27$$

$$WZ = 15 + 12 = 27$$

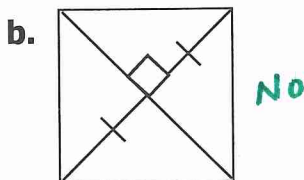
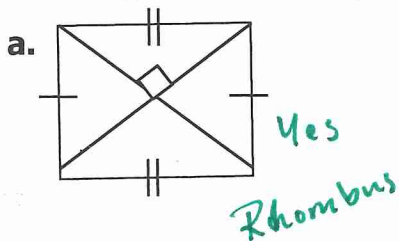
11. In the rhombus below,  $m\angle 1 = 9x$ ,  $m\angle 2 = 4x + 15$ , and  $m\angle 3 = 30z$ . Find the values of  $x$  and  $z$ .



$$30z = 90$$

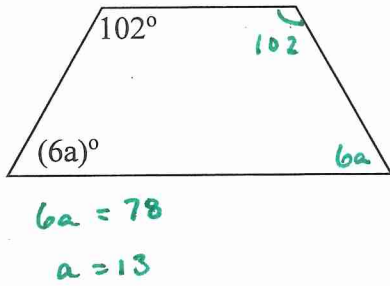
$$z = 3$$

12. With the given information, can you conclude that each of the following figures is a parallelogram? Explain why or why not. Classify the figure further if possible.

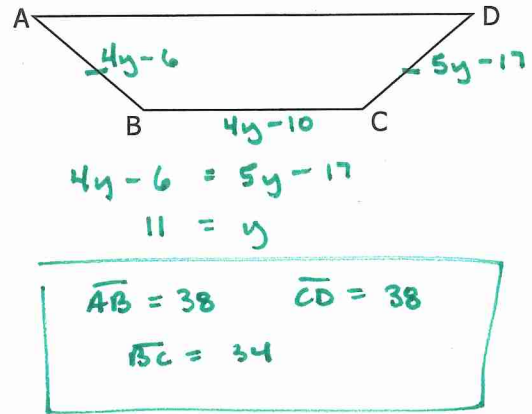


**Section 6.5**

13. Find the value of  $a$  for the trapezoid.



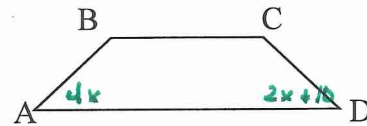
14. In isosceles trapezoid ABCD,  $AB = 4y - 6$ ,  $BC = 4y - 10$ , and  $CD = 5y - 17$ . Find the value of  $y$ . Then, give the length of both legs and base  $\overline{BC}$ .



15. Trapezoid ABCD is isosceles.

a. Find  $m\angle C$  if  $m\angle A = 4x$  and  $m\angle D = 2x + 10$ .

$4x + 2x + 10 = 180$   
 $6x = 170$   
 $x = 28.3$



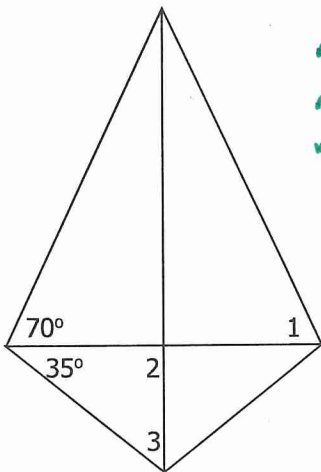
$m\angle C = 4x = 113.3^\circ$

b.  $AC = 3y + 9$  and  $BD = 6y - 9$ . Find the value of  $y$  and the length of each diagonal.

$AC = BD$   
 $3y + 9 = 6y - 9$   
 $18 = 3y$      $y = 6$

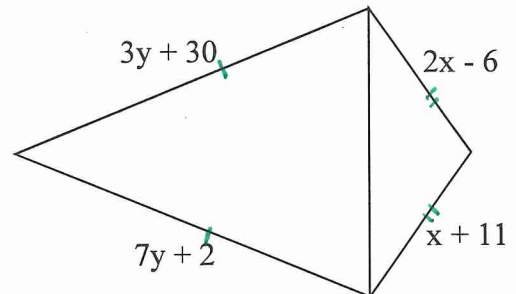
$AC = 27 = BD$

16. Find  $m\angle 1$ ,  $m\angle 2$ , and  $m\angle 3$  in the kite.



$m\angle 1 = 70^\circ$   
 $m\angle 2 = 90^\circ$   
 $m\angle 3 = 55^\circ$

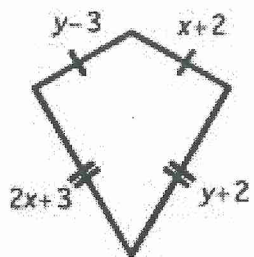
17. Find the values of  $x$  and  $y$  and the lengths of the sides of the kite.



$3y + 30 = 7y + 2$   
 $28 = 4y$   
 $y = 7$

$2x - 6 = x + 11$   
 $x = 17$

18. Find the values of  $x$  and  $y$  for the kite.



$$y-3 = x+2$$

$$y = x+5$$

$$y = 4+5$$

$$y = 9$$

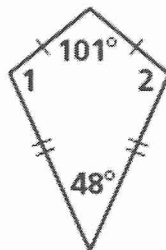
$$2x+3 = y+2$$

$$2x+3 = (x+5)+2$$

$$2x+3 = x+7$$

$$x = 4$$

19. Find  $m\angle 1$  and  $m\angle 2$  in the kite.



$$360 - 101 - 48 = 211^\circ$$

$$m\angle 1 \cong m\angle 2 = \boxed{105.5^\circ}$$

### Equations of Lines

20. Write the equation of the line through the points  $A(2, 6)$  and  $B(3, 9)$ . Give your answer in slope-intercept form.

$$m = \frac{6-9}{2-3} = \frac{-3}{-1} = 3$$

$$y - 6 = 3(x - 2)$$

$$y - 6 = 3x - 6 \Rightarrow y = 3x$$

21. Write the equation of the line parallel to the line  $x = 7$  that goes through the point  $(-2, 5)$ .

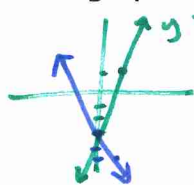
$$k = -2$$

22. Write the equation of the line perpendicular to the line  $y = -3x + 1$  that goes through the point  $(-6, 1)$ . Give your answer in slope-intercept form.

$$\hookrightarrow m = \frac{1}{3}$$

$$y - 1 = \frac{1}{3}(x + 6) \Rightarrow y - 1 = \frac{1}{3}x + 2 \Rightarrow y = \frac{1}{3}x + 3$$

23. What would happen to the graph of the line  $y = 4x - 3$  if the slope was changed to  $-2$ ?



$$y = 4x - 3 \quad y = -2x - 3$$

Positive to negative slope.

24. What would happen to the graph of the line  $y = -5x + 6$  if the  $y$ -intercept was changed to  $-1$ ?

$$y = -5x + 6 \rightarrow y = -5x - 1$$

Shifts the whole graph down 7.