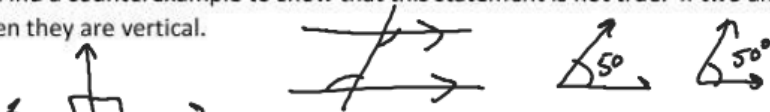


**Review Section:**

1. Find a counterexample to show that this statement is not true. If two angles are congruent, then they are vertical.



2. If point  $(p, q)$  is  $\frac{3}{4}$  of the way from A to B, what are the values of  $p$  and  $q$ ?

Distance between  $x$ -values

$$-3 - (-5) = 2$$

$$2\left(\frac{3}{4}\right) = 1.5$$

Distance between  $y$ -values

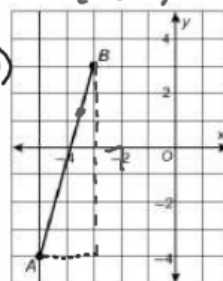
$$3 - (-4) = 7$$

$$7\left(\frac{3}{4}\right) = 5.25$$

$$-5 + 1.5 = -3.5$$

$$-4 + 5.25 = 1.25$$

A(-5, -4) B(-3, 3)



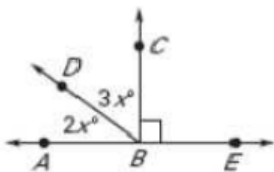
3. Consider the statement: If James has at least two \$10 bills, then he has at least \$20.

a. Is this a true statement? Justify your reasoning.

b. Write the converse of this statement. Is this a true statement? Explain.

If James has at least \$20, then he has at least two \$10 bills.

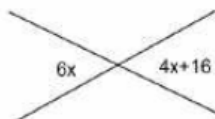
4. Find the value of the variable.



$$2x + 3x = 90$$

$$5x = 90$$

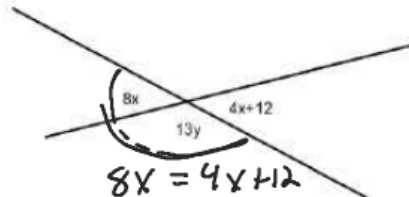
$$x = 18$$



$$6x = 4x + 16$$

$$2x = 16$$

$$x = 8$$



$$8x = 4x + 12$$

$$4x = 12$$

$$x = 3$$

$$8x + 13y = 180$$

$$24 + 13y = 180$$

$$13y = 156$$

$$y = 12$$

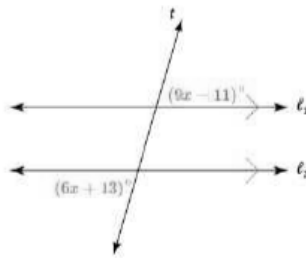
**Section: Properties of Parallel Lines**

Use the figure to answer each question in this section.

5. If  $c \parallel d$ ,  $a \parallel b$ , and  $m\angle 17 = 45^\circ$ , then  $m\angle 6 =$  \_\_\_\_\_

6. If  $\angle 15 \cong \angle 8$  then which two lines are parallel? Explain your answer.

7. Find the value of  $x$ .



8. Use the figure to the right. Lines  $a$ ,  $b$ ,  $c$ , and  $d$  intersect as shown.

a. Which pair of lines are parallel?

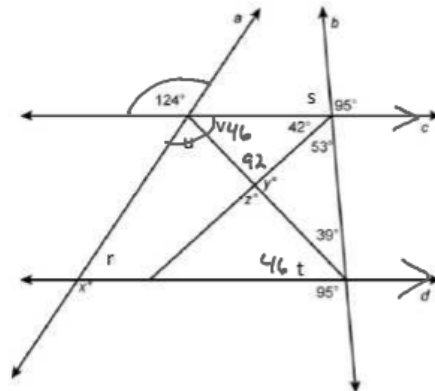
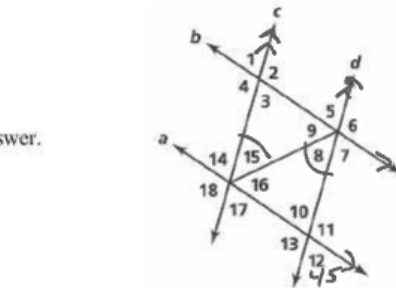
$$53 + 39 + y = 180$$

$$z = 53 + 39$$

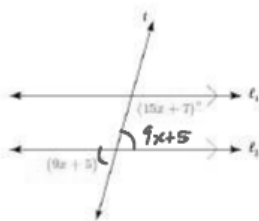
b. Find the value of the variables.

$$r = 56 \quad s = 85 \quad t = 46 \quad u = 78$$

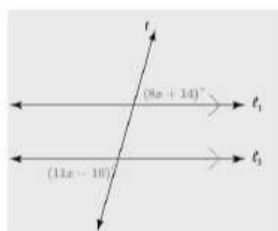
$$v = 46 \quad x = 124 \quad y = 88 \quad z = 92$$



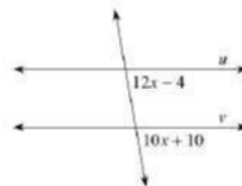
9. Find the value of the variable that will make the lines parallel.



$$\begin{aligned} 15x + 7 + 9x + 5 &= 180 \\ 24x + 12 &= 180 \\ 24x &= 168 \\ x &= 7 \end{aligned}$$



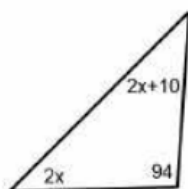
$$\begin{aligned} 8x + 14 &= 11x - 10 \\ 24 &= 3x \\ x &= 8 \end{aligned}$$



$$\begin{aligned} 12x - 4 &= 10x + 10 \\ 2x &= 14 \\ x &= 7 \end{aligned}$$

### Section: Triangle Sum and Exterior Angle Theorem

10. Find the values of the variable.

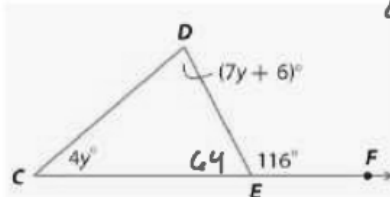


$$2x + 2x + 10 + 94 = 180$$

$$4x + 104 = 180$$

$$4x = 76$$

$$x = 19$$



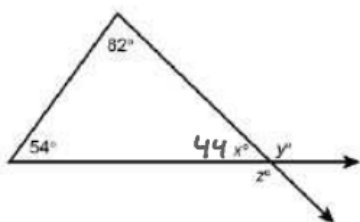
$$4y + 7y + 6 = 114$$

$$11y + 6 = 116$$

$$11y = 110$$

$$y = 10$$

11. Given the figure, find the values of the variables.



$$x + 82 + 54 = 180$$

$$x + 136 = 180$$

$$x = 44$$

$$y = 82 + 54$$

$$= 136$$

$$z = 136$$

### Section: Slopes of Parallel and Perpendicular Lines

12. Are the lines parallel, perpendicular, or neither?

$$y = \frac{2}{3}x - 2$$

$$3x + 2y = 6$$

$$-3x$$

$$2y = -3x + 6$$

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

$$3x + 2y = 6$$

⊥

13. Write an equation for a line (in slope-intercept form) parallel to  $y = -5x - 3$  and passing through the point  $(2, -12)$

$$m = -5 \quad (2, -12)$$

$$x_1 \quad y_1$$

$$y - y_1 = m(x - x_1)$$

$$y + 12 = -5(x - 2)$$

$$y + 12 = -5x + 10$$

$$y = -5x - 2$$

14. Write an equation for a line (in slope intercept form) perpendicular to the line  $y = -2x + 4$  and passes through the point  $(-4, -1)$

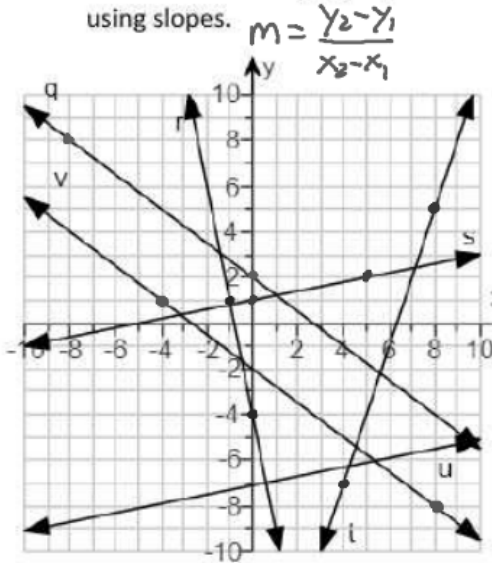
$$m = \frac{1}{2} \quad (-4, -1)$$

$$y = \frac{1}{2}x + 1$$

$$y + 1 = \frac{1}{2}(x + 4)$$

$$y + 1 = \frac{1}{2}x + 2$$

15. Given the following figure, find which lines will be parallel and/or perpendicular. Verify by using slopes.



$$m = \frac{y_2 - y_1}{x_2 - x_1}$$

Slope  $q$   
 $(-2, 8) (0, 2)$   
 $\frac{2-8}{0-(-2)} = \frac{-6}{2} = -3$

Slope  $v$   
 $(-4, 1) (8, -8)$   
 $\frac{-8-1}{8+4} = \frac{-9}{12} = -\frac{3}{4}$

Slope  $s$   
 $(0, 1) (5, 2)$   
 $\frac{2-1}{5-0} = \frac{1}{5}$

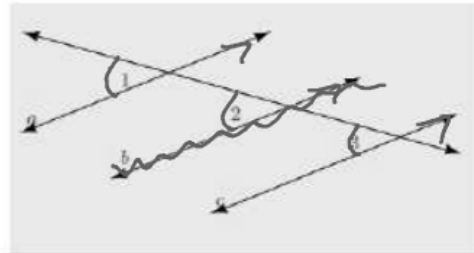
Slope  $r$   
 $(-1, 1) (0, -4)$   
 $\frac{-4-1}{0+1} = \frac{-5}{1} = -5$

Slope  $t$   
 $(8, 5) (4, -7)$   
 $\frac{-7-5}{4-8} = \frac{-12}{-4} = 3$

$q \parallel v$   $s \perp r$

### Section Proofs

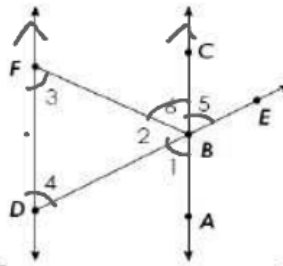
16. Given  $a \parallel b, b \parallel c$   
 Prove  $a \parallel c$



Statement	Reason
1. $a \parallel b, b \parallel c$	1. Given
2. $\angle 1 \cong \angle 2$ and $\angle 2 \cong \angle 3$	2. Corresponding $\angle$ 's
3. $\angle 1 \cong \angle 3$	3. Substitution Property
4. $a \parallel c$	4. Converse of Corresponding $\angle$ 's

17. Given:  $\overline{FD} \parallel \overline{CA}$   
 $\angle 3 \cong \angle 4$

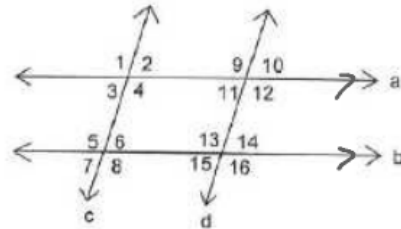
Prove:  $\angle 5 \cong \angle 6$



Statement	Reason
1. $\overline{FD} \parallel \overline{CA}$ $\angle 3 \cong \angle 4$	1. Given
2. $\angle 1 \cong \angle 4$	2. Alternate Interior $\angle$ 's
3. $\angle 1 \cong \angle 5$	3. Vertical Angles are Congruent
4. $\angle 3 \cong \angle 6$	4. Alternate Interior $\angle$ 's $\cong$
5. $\angle 3 \cong \angle 1$	5. Substitution
6. $\angle 3 \cong \angle 5$	6. Substitution
7. $\angle 5 \cong \angle 6$	7. Substitution

18. Given:  $a \parallel b$

Prove:  $\angle 9$  and  $\angle 14$  are supplementary



Statement	Reason
1. $a \parallel b$	1. Given
2. $m\angle 9 + m\angle 11 = 180$	2. Linear Pair Post.
3. $\angle 11 \cong \angle 14$	3. Alt Interior $\angle$ 's
4. $m\angle 11 = m\angle 14$	4. Definition of Congruent Angles
5. $m\angle 9 + m\angle 14 = 180$	5. Substitution Property
6. $\angle 9 + \angle 14$ are supp	6. Def of Supp $\angle$ 's