

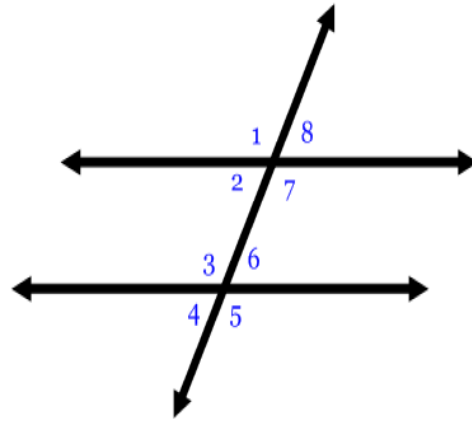
Parallel Lines and Perpendicular Lines

... Answers are on the next page

Read all directions. Diagrams are not drawn to scale.

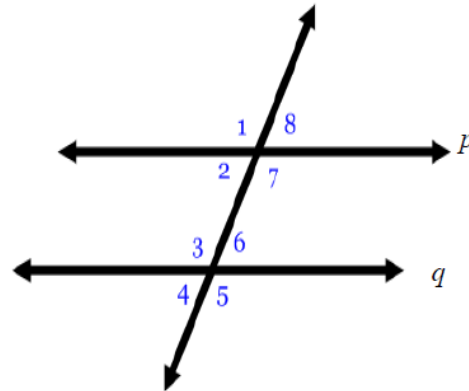
Identify the following pairs of angles as vertical, corresponding, alternate interior, alternate exterior, linear pair or consecutive interior angles (2 points each).

1. $\angle 1$ and $\angle 3$ _____
2. $\angle 3$ and $\angle 7$ _____
3. $\angle 3$ and $\angle 6$ _____
4. $\angle 1$ and $\angle 8$ _____
5. $\angle 2$ and $\angle 3$ _____
6. $\angle 4$ and $\angle 8$ _____
7. $\angle 2$ and $\angle 4$ _____

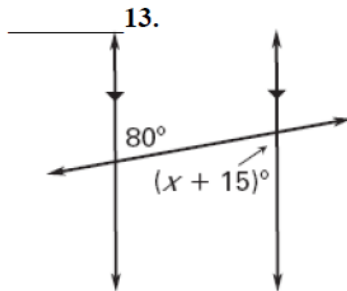


If lines p and q are parallel find the missing angle. Write your answer in the blank (2 points each).

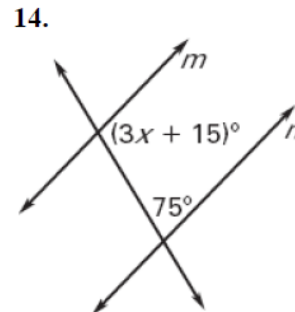
8. If $m\angle 2 = 20$, $m\angle 6 =$ _____.
9. If $m\angle 7 = 150$, $m\angle 6 =$ _____.
10. If $m\angle 1 = 145$, $m\angle 5 =$ _____.
11. If $m\angle 4 = 28$, $m\angle 7 =$ _____.
12. If $m\angle 3 = 125$, $m\angle 8 =$ _____.



Find the value of x .
Show all work (3 points).



Find the value of x that makes $m \parallel n$.
Show all work (3 points).



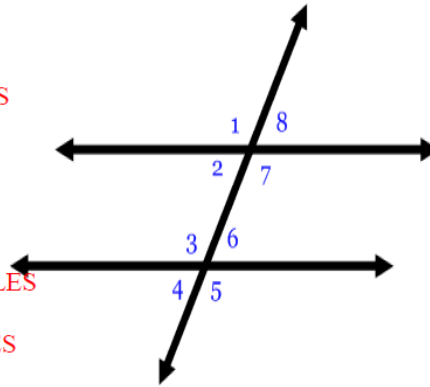
Parallel Lines and Perpendicular Lines

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Answers

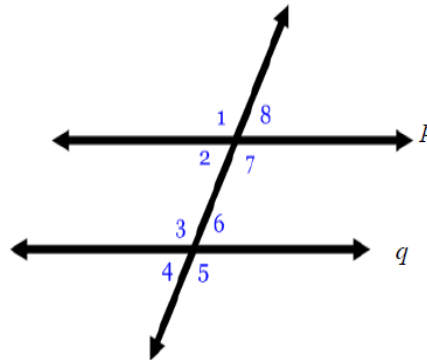
Identify the following pairs of angles as vertical, corresponding, alternate interior, alternate exterior, linear pair or consecutive interior angles (2 points each).

1. $\angle 1$ and $\angle 3$ **CORRESPONDING ANGLES**
2. $\angle 3$ and $\angle 7$ **ALTERNATE INTERIOR ANGLES**
3. $\angle 3$ and $\angle 6$ **LINEAR PAIR ANGLES**
4. $\angle 1$ and $\angle 8$ **LINEAR PAIR ANGLES**
5. $\angle 2$ and $\angle 3$ **CONSECUTIVE INTERIOR ANGLES**
6. $\angle 4$ and $\angle 8$ **ALTERNATE EXTERIOR ANGLES**
7. $\angle 2$ and $\angle 4$ **CORRESPONDING ANGLES**

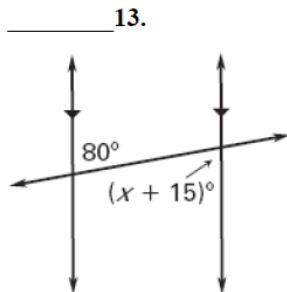


If lines p and q are parallel find the missing angle. Write your answer in the blank (2 points each).

8. If $m\angle 2 = 20$, $m\angle 6 =$ 20°.
9. If $m\angle 7 = 150$, $m\angle 6 =$ 30°.
10. If $m\angle 1 = 145$, $m\angle 5 =$ 145°.
11. If $m\angle 4 = 28$, $m\angle 7 =$ 152°.
12. If $m\angle 3 = 125$, $m\angle 8 =$ 55°.

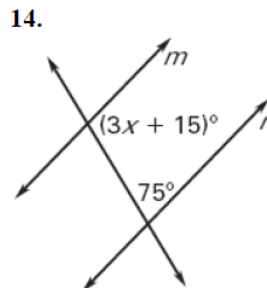


Find the value of x.
Show all work (3 points).



$$\begin{aligned} 80 &= X + 15 && (2) \\ 65 &= X && (1) \end{aligned}$$

Find the value of x that makes m || n.
Show all work (3 points).



$$\begin{aligned} 3X + 15 + 75 &= 180 && (2) \\ 3X + 90 &= 180 && \\ 3X &= 90 && \\ X &= 30 && (1) \end{aligned}$$

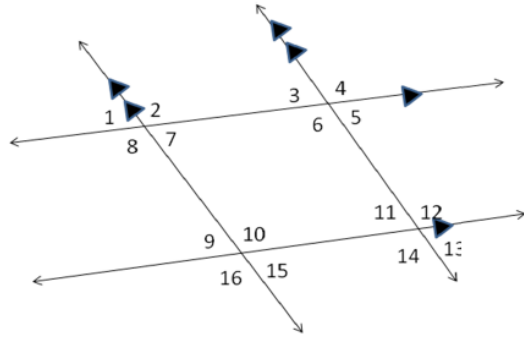
Here's another approach:

$$\begin{aligned} 3X + 15 &= 105 && (2) \\ 3X &= 90 && \\ X &= 30 && (1) \end{aligned}$$

Parallel Lines and Perpendicular Lines ... Answers are on the next page

Use the diagram below to fill in the blanks (2 points each).

15. a.) If $m\angle 1 = 25^\circ$, then $m\angle 13 =$ _____
 b.) If $m\angle 10 = 145^\circ$, then $m\angle 6 =$ _____
 c.) If $m\angle 14 = 120^\circ$, then $m\angle 7 =$ _____
 d.) If $m\angle 9 = 25^\circ$, then $m\angle 4 =$ _____



Tell whether the lines through the given points are parallel, perpendicular, or neither. Show all work!! (4 points each)

- | | | |
|---|---|--|
| 16. Line 1: $(-1, 2), (2, 3)$
Line 2: $(0, 0), (3, 1)$ | 17. Line 3: $(0, 1), (1, 3)$
Line 4: $(4, -1), (5, 2)$ | 18. Line 5: $(-5, 0), (-3, -2)$
Line 6: $(0, 4), (-2, 2)$ |
|---|---|--|

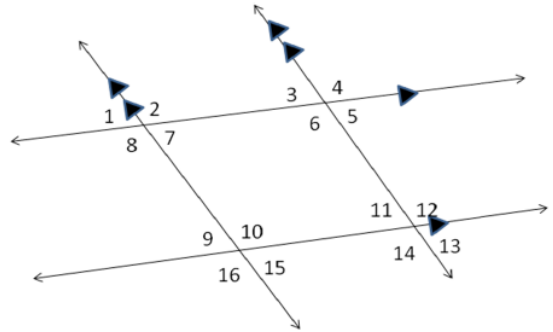
Parallel Lines and Perpendicular Lines

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Answers

Use the diagram below to fill in the blanks (2 points each).

15. a.) If $m\angle 1 = 25^\circ$, then $m\angle 13 = \underline{25^\circ}$
 b.) If $m\angle 10 = 145^\circ$, then $m\angle 6 = \underline{145^\circ}$
 c.) If $m\angle 14 = 120^\circ$, then $m\angle 7 = \underline{60^\circ}$
 d.) If $m\angle 9 = 25^\circ$, then $m\angle 4 = \underline{155^\circ}$



Tell whether the lines through the given points are parallel, perpendicular, or neither. Show all work!!
 (4 points each – 1 point each slope, 2 points conclusion written in complete sentence.)

16. Line 1: (-1, 2), (2, 3)
 Line 2: (0, 0), (3, 1)

$$m_1 = \frac{3-2}{2-(-1)} = \frac{1}{3}$$

$$m_2 = \frac{1-0}{3-0} = \frac{1}{3}$$

Since the slopes are equal,
 Line 1 is parallel to Line 2.

17. Line 3: (0, 1), (1, 3)
 Line 4: (4, -1), (5, 2)

$$m_3 = \frac{3-1}{1-0} = \frac{2}{1} = 2$$

$$m_4 = \frac{2-(-1)}{5-4} = \frac{3}{1} = 3$$

Line 3 and Line 4 are neither
 parallel nor perpendicular.

18. Line 5: (-5, 0), (-3, -2)
 Line 6: (0, 4), (-2, 2)

$$m_5 = \frac{-2-0}{-3-(-5)} = \frac{-2}{2} = -1$$

$$m_6 = \frac{2-4}{-2-0} = \frac{-2}{-2} = 1$$

Since the slopes are negative
 reciprocals, Line 5 is
 perpendicular to Line 6.

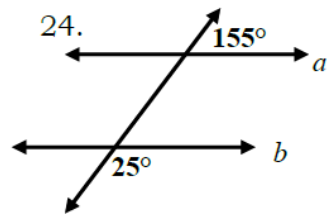
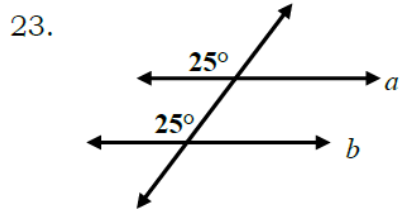
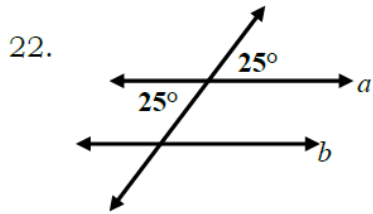
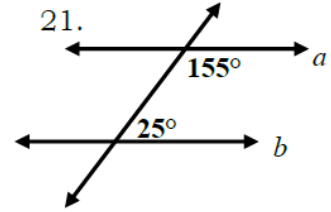
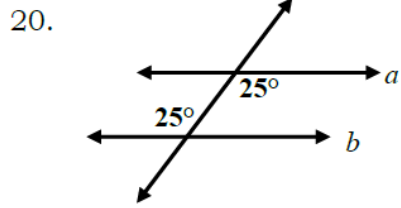
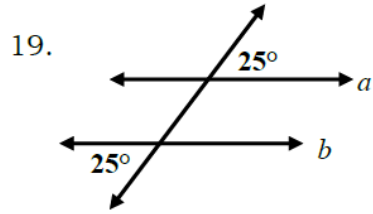
Be sure to identify each line appropriately:

$$\frac{3-2}{2-(-1)} = \frac{1}{3} \quad \text{OR} \quad m = \frac{3-2}{2-(-1)} = \frac{1}{3}$$

DOES NOT EARN CREDIT!!

Parallel Lines and Perpendicular Lines
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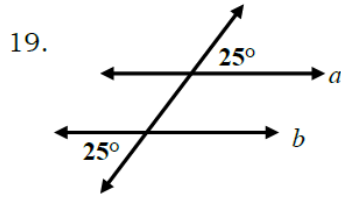
Is it possible to prove the lines shown are parallel? If yes, state how you know (postulate/theorem). (3 points each)



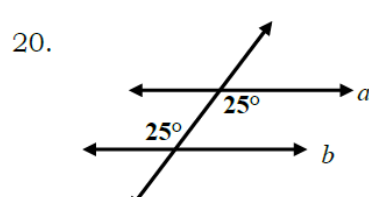
Parallel Lines and Perpendicular Lines
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Answers

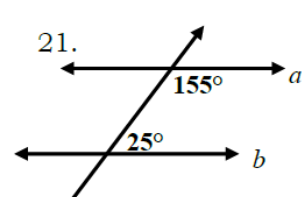
Is it possible to prove the lines shown are parallel? If yes, state how you know (postulate/theorem). (3 points each)



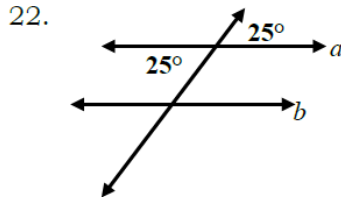
$a \parallel b$ by the Alternate Exterior Angles Converse.



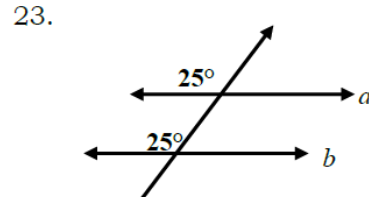
$a \parallel b$ by the Alternate Interior Angles Converse.



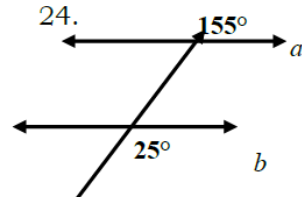
$a \parallel b$ by the Consecutive Interior Angles Converse.



There is not enough information to determine if the lines are parallel.



$a \parallel b$ by the Corresponding Angles Converse.



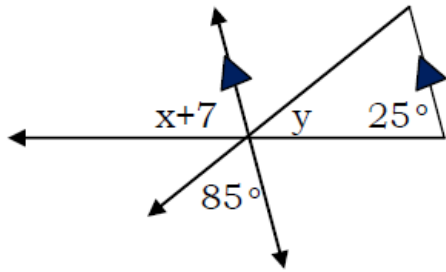
There is not enough info to determine if the lines are parallel.

Parallel Lines and Perpendicular Lines
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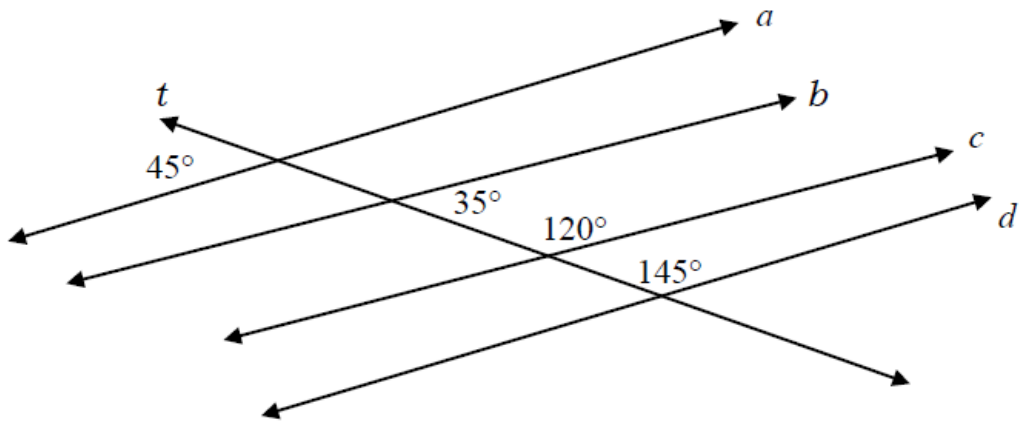
Find the values of x and y . Show all work (2 points each).

25. $x =$ _____

$y =$ _____



_____ 26. Which lines are parallel in the diagram?(4 points)



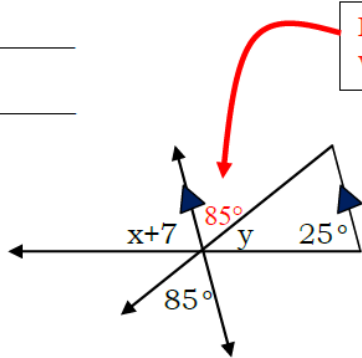
Parallel Lines and Perpendicular Lines

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Answers

Find the values of x and y. Show all work (2 points each).

25. $x =$ _____
 $y =$ _____



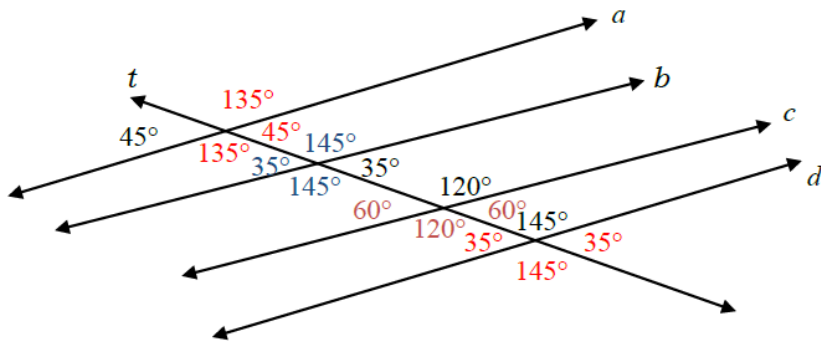
First, identify the vertical angle of 85° .

Second, use the parallel lines to set up the equation:
 $85 + y + 25 = 180$ (1)
 $Y + 110 = 180$
 $Y = 70$ (1)

Third, notice that the $(x+7)$, 85 , and y make a straight line. This gives us
 $X + 7 + 85 + y = 180$
 Substituting 70 for y :
 $X + 7 + 85 + (70) = 180$ (1)
 $X + 162 = 180$
 $X = 18$ (1)

26. Which lines are parallel in the diagram?(4 points)

Find the missing angles around each line that is cut by transversal t .



Lines b and d are parallel.