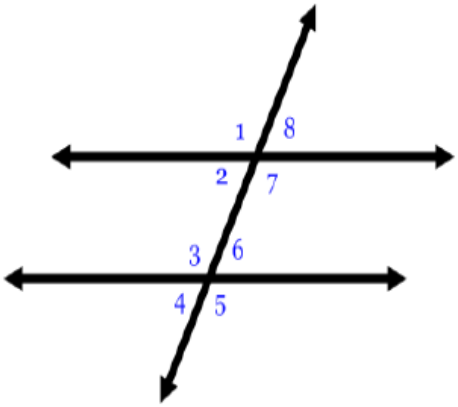
Parallel Lines and Angles …. Set 2 (with Answers)

Read all directions. Diagrams are not drawn to scale. Do your best!

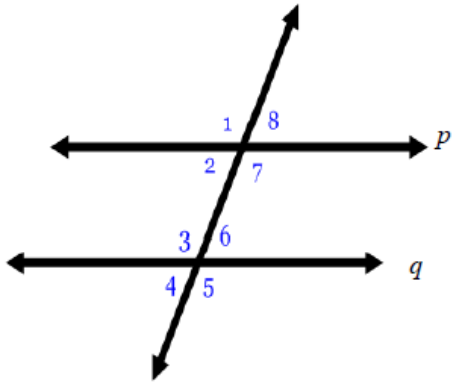
Identify the following pairs of angles as vertical, corresponding, alternate interior, alternate exterior, linear pair or consecutive interior angles (2 points each).

1. ∠1 and ∠3 _____
2. ∠3 and ∠7 _____
3. ∠3 and ∠6 _____
4. ∠1 and ∠8 _____
5. ∠2 and ∠3 _____
6. ∠4 and ∠8 _____
7. ∠2 and ∠4 _____



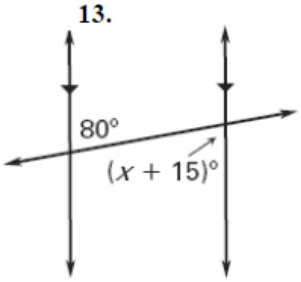
If lines p and q are parallel find the missing angle. Write your answer in the blank (2 points each).

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 $m\angle 3 = 125$, $m\angle 8 =$ _____.



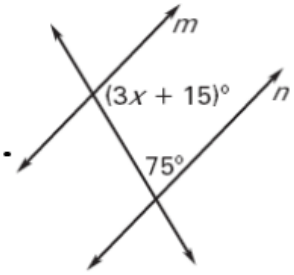
Find the value of x.
Show all work (3 points).

13.



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

14.

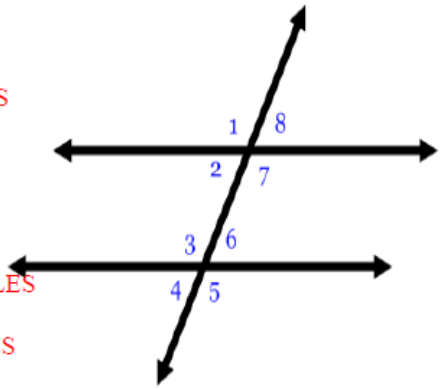


Parallel Lines and Angles …. Set 2 (with Answers)

Answers

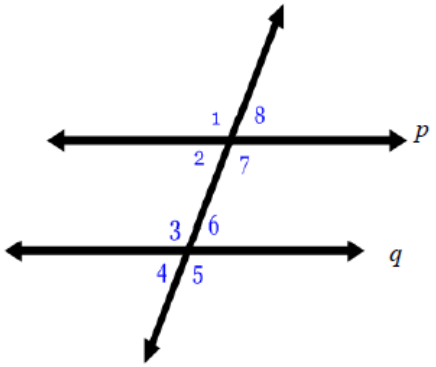
Identify the following pairs of angles as vertical, corresponding, alternate interior, alternate exterior, linear pair or consecutive interior angles (2 points each).

1. ∠1 and ∠3 CORRESPONDING ANGLES
2. ∠3 and ∠7 ALTERNATE INTERIOR ANGLES
3. ∠3 and ∠6 LINEAR PAIR ANGLES
4. ∠1 and ∠8 LINEAR PAIR ANGLES
5. ∠2 and ∠3 CONSECUTIVE INTERIOR ANGLES
6. ∠4 and ∠8 ALTERNATE EXTERIOR ANGLES
7. ∠2 and ∠4 CORRESPONDING ANGLES



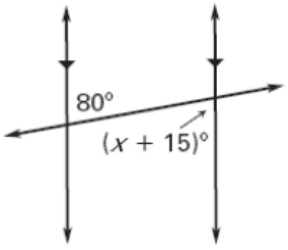
If lines p and q are parallel find the missing angle. Write your answer in the blank (2 points each).

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).

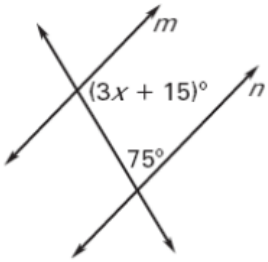
13.



80 = X + 15 (2)
65 = X (1)

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

14.

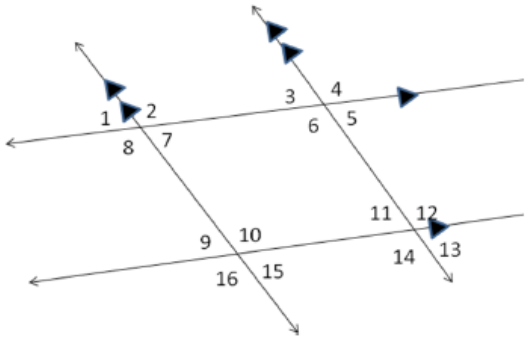


3X + 15 + 75 = 180 (2)
3X + 90 = 180
3X = 90
X = 30 (1)

Here's another approach:
3X + 15 = 105 (2)
3X = 90
X = 30 (1)

Parallel Lines and Angles …. Set 2 (with Answers)

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



15. a.) If $m\angle 1 = 25°$, then $m\angle 13 =$ _____

b.) If $m\angle 10 = 145°$, then $m\angle 6 =$ _____

c.) If $m\angle 14 = 120°$, then $m\angle 7 =$ _____

d.) If $m\angle 9 = 25°$, then $m\angle 4 =$ _____

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

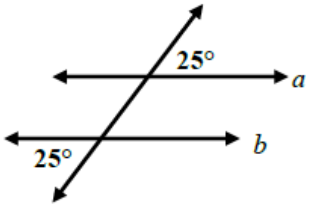
16. Line 1: (-1, 2), (2, 3)
Line 2: (0, 0), (3, 1)

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

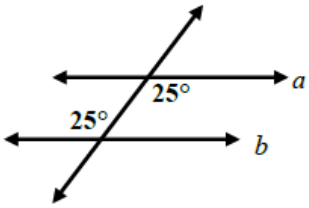
18. Line 5: (-5, 0), (-3, -2)
Line 6: (0, 4), (-2, 2)

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

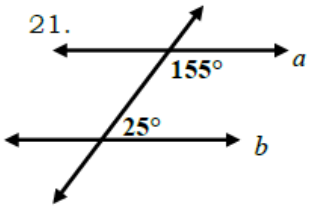
19.



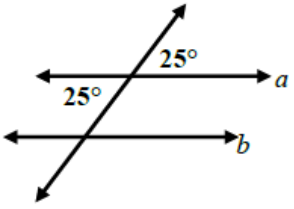
20.



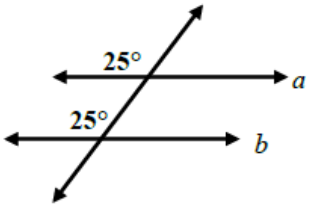
21.



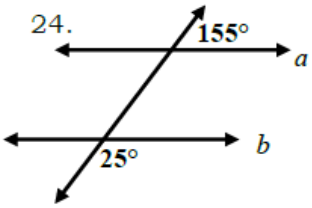
22.



23.



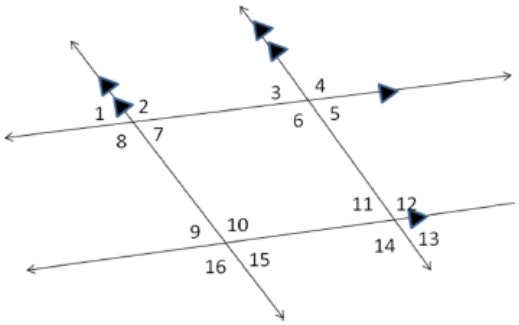
24.



Parallel Lines and Angles …. Set 2 (with Answers)

Answers

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



15. a.) If $m\angle 1 = 25°$, then $m\angle 13 =$ _____25°_____

b.) If $m\angle 10 = 145°$, then $m\angle 6 =$ ____145°_____

c.) If $m\angle 14 = 120°$, then $m\angle 7 =$ ____60°_____

d.) If $m\angle 9 = 25°$, then $m\angle 4 =$ ____155°_____

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.

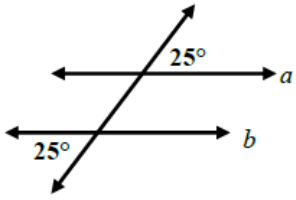
Be sure to identify each line appropriately:

$\frac{3-2}{2+1} = \frac{1}{3}$ OR $m = \frac{3-2}{2+1} = \frac{1}{3}$

DOES NOT EARN CREDIT!!

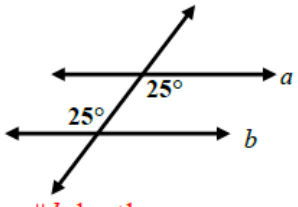
Is it possible to prove the lines shown are parallel? If yes, state how you know (postulate/theorem). (3 points each)

19.



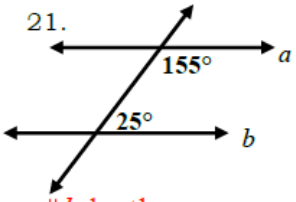
$a \| b$ by the Alternate Exterior Angles Converse.

20.



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

21.

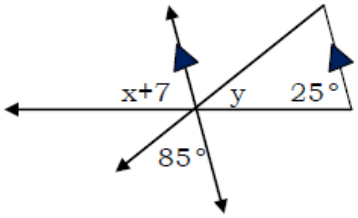


$a \| b$ by the Consecutive Interior Angles Converse.

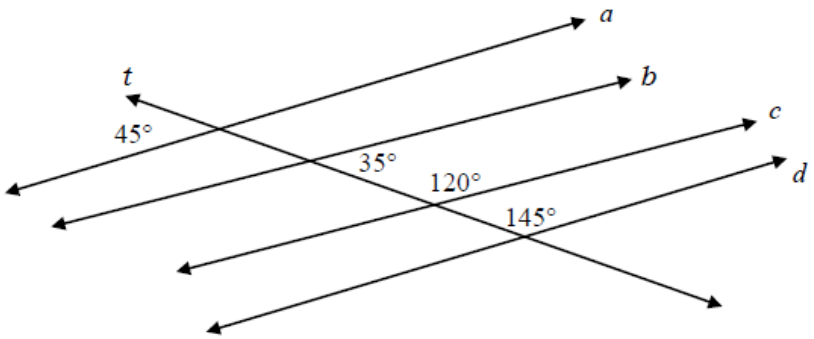
Find the values of x and y. Show all work (2 points each).

25. x=_____

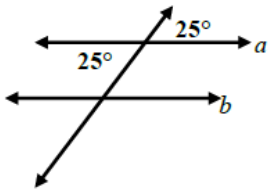
y=_____



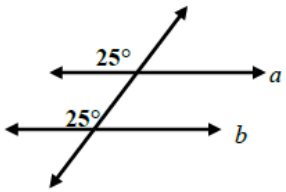
_____26. **Which lines are parallel in the diagram?(4 points)**



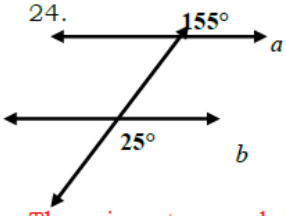
Answers

22. 

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

23. 

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

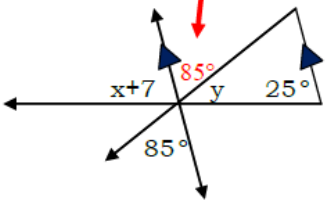
24. 

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

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

25. x=_____

y=_____



First, identify the vertical angle of 85°.

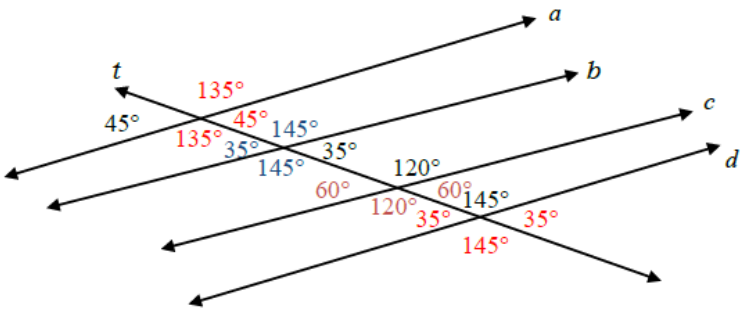
Second, use the parallel lines to set up the equation:
85 + y + 25 = 180 (1)
Y + 110 = 180
Y = 70 (1)

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.