

**Unit 3: Parallel and Perpendicular Lines Study Guide**

**3.1 Pairs of Lines and Angles**

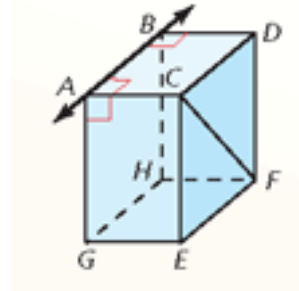
Think of each segment in the figure as a line.

1. Which line(s) appear perpendicular to  $\overleftrightarrow{AB}$ ?

2. Which line(s) appear parallel to  $\overleftrightarrow{AB}$ ?

3. Which line(s) appear skew to  $\overleftrightarrow{AB}$ ?

4. Which plane(s) appear parallel to plane  $ABC$ ?



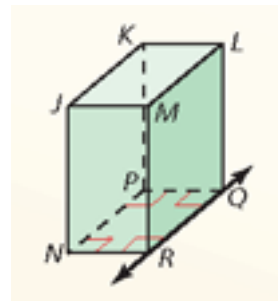
Think of each segment in the figure as a line. Which line(s) or plane(s) appear to fit the description?

5. line(s) perpendicular to  $\overleftrightarrow{QR}$

6. line(s) parallel to  $\overleftrightarrow{QR}$

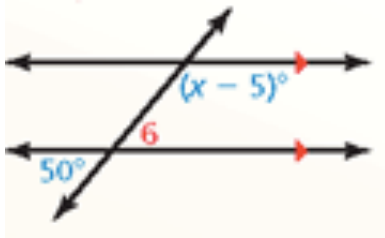
7. line(s) skew to  $\overleftrightarrow{QR}$

8. plane(s) parallel to plane  $LMQ$



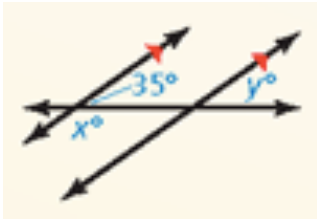
### 3.2 Parallel Lines and Transversals

9. Find the value of  $x$ .

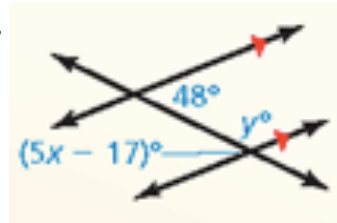


Find the values of  $x$  and  $y$ .

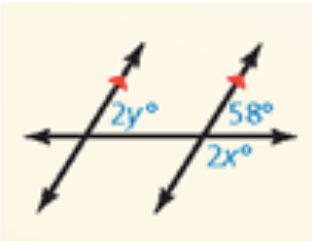
10.



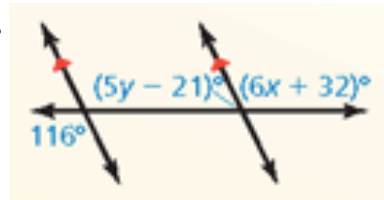
11.



12.

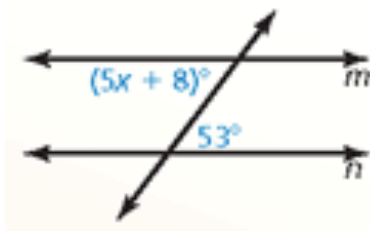


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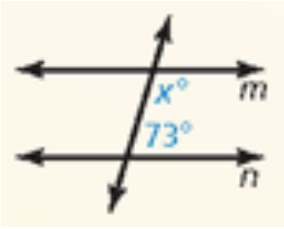
### 3.3 Proofs with Parallel Lines

14. Find the value of  $x$  that makes  $m \parallel n$ .

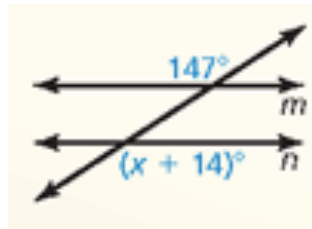


Find the value of  $x$  that makes  $m \parallel n$ .

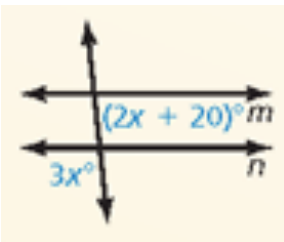
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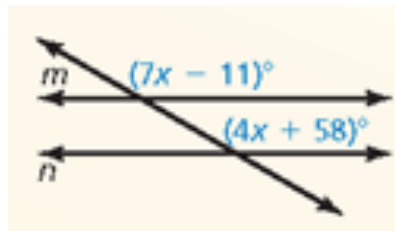
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17.

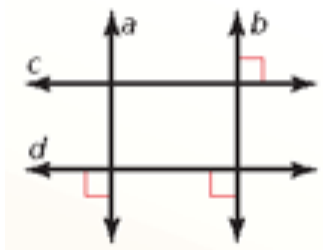


18.



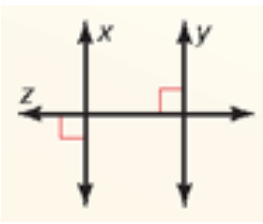
### 3.4 Proofs with Perpendicular Lines

19. Determine which lines, if any, must be parallel. Explain your reasoning.

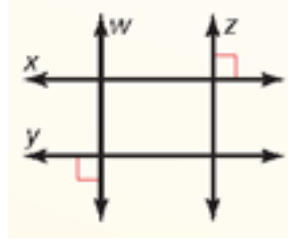


Determine which lines, if any, must be parallel. Explain your reasoning.

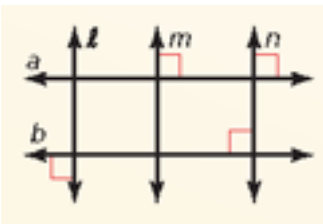
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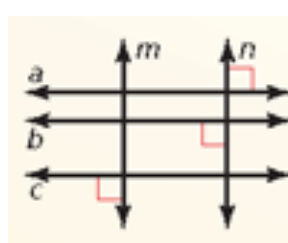
21.



22.



23.



### 3.5 Equations of Parallel and Perpendicular Lines

24. Write an equation of the line passing through the point  $(-2, 4)$  that is parallel to the line  $y = 5x - 7$ .

**25.** Write an equation of the line passing through the point  $(6,1)$  that is perpendicular to the line  $3x + y = 9$ .

**Write an equation of the line passing through the given point that is parallel to the given line.**

**26.**  $A(3, -4), y = -x + 8$

**27.**  $A(-6,5), y = \frac{1}{2}x - 7$

**28.**  $A(2,0), y = 3x - 5$

**29.**  $A(3, -1), y = \frac{1}{7}x + 4$

**Write an equation of the line passing through the given point that is perpendicular to the given line.**

**30.**  $A(6, -1), y = -2x + 8$

**31.**  $A(0,3), y = -\frac{1}{2}x - 6$

**32.**  $A(8,2), y = 4x - 7$

**33.**  $A(-1,5), y = \frac{1}{7}x + 4$

**Find the distance from point  $A$  to the given line.**

**34.**  $A(2, -1), y = -x + 4$

**35.**  $A(-2,3), y = \frac{1}{2}x + 1$