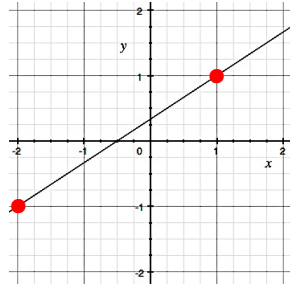


### 3.4 Geometric Characteristics of Lines

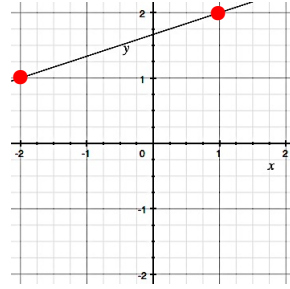
Name \_\_\_\_\_

Determine the slope of each line.

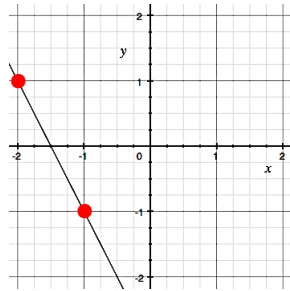
1.



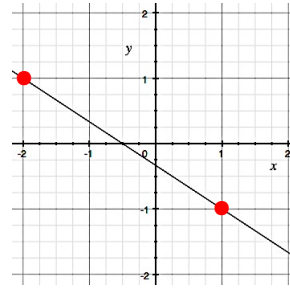
2.



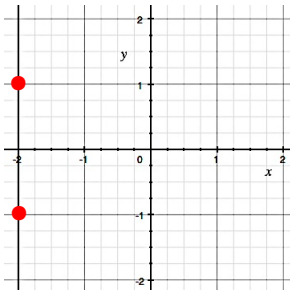
3.



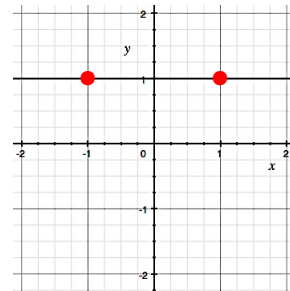
4.



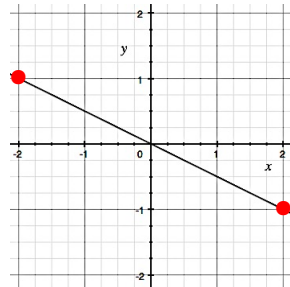
5.



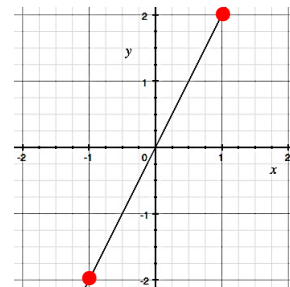
6.



7.

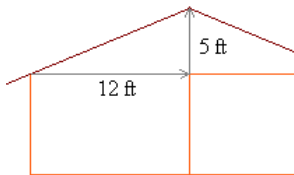


8.



Answers: 1.  $\frac{2}{3}$ ; 3.  $-2$ ; 5. undefined; 7.  $-\frac{1}{2}$

**9.** The roof “pitch” that builders refer to is the same as the slope of the roof. Find the slope of the roof in the drawing.



**10.** A road on a hill slopes down as shown below. What is the numerical slope associated with this hill?



Determine the slope of the line that passes through each pair of points.

**11.** (3, 4) and (5, 9)

**12.** (0, 8) and (3, 4)

**13.** (2, -1) and (5, -1)

**14.** (-3, 4) and (4, 4)

**15.** (3, 4) and (3, -9)

**16.** (-5, 4) and (-5, 0)

**17.** (1, 4) and (3, 2)

**18.** (5, 2) and (8, 8)

Answers: **9.**  $m = \frac{5}{12}$ ; **11.**  $m = \frac{5}{2}$ ; **13.**  $m = 0$ ; **15.** slope is undefined; **17.**  $m = -1$

<p><b>19.</b> During the year 2007, a Honda dealer sold 15 Civic-hybrid cars. In the following years, demand for hybrid cars increased, and in 2012, the same dealer sold 100 Civic-hybrid cars.</p> <p><b>(a)</b> Find the slope of the line through the points (2007, 15) and (2012, 100).</p> <p><b>(b)</b> What is the rate of increase in Civic-hybrid sales per year?</p>	<p><b>20.</b> A small company produced 685 picnic tables in 2011. By the year 2013 it produced 1321 picnic tables.</p> <p><b>(a)</b> Find the slope of the line through the points (2011, 685) and (2013, 1321).</p> <p><b>(b)</b> What is the rate of increase in picnic table production per year?</p>
<p>Determine the slope and the <math>y</math>-intercept of each equation.</p>	
<p><b>21.</b> <math>y = \frac{2}{3}x + 5</math></p>	<p><b>22.</b> <math>y = -5x + 2</math></p>
<p><b>23.</b> <math>2x + 6y = 12</math></p>	<p><b>24.</b> <math>4x + 3y = 6</math></p>
<p><b>25.</b> <math>6y = 12x</math></p>	<p><b>26.</b> <math>2y = -8x</math></p>
<p><b>27.</b> <math>y = 15</math></p>	<p><b>28.</b> <math>y = -2</math></p>
<p>Answers: <b>19.</b> <b>(a)</b> <math>m = 17</math>, <b>(b)</b> 17; <b>21.</b> <math>m = \frac{2}{3}</math>, <math>b = 5</math>; <b>23.</b> <math>m = -\frac{1}{3}</math>, <math>b = 2</math>; <b>25.</b> <math>m = 2</math>, <math>b = 0</math>; <b>27.</b> <math>m = 0</math>, <math>b = 15</math></p>	

Determine whether the following pairs of lines are parallel, perpendicular, or neither.	
<b>29.</b> $y = -5x + 1$ and $y = \frac{1}{5}x + 12$	<b>30.</b> $y = \frac{1}{2}x + 5$ and $y = -2x - 2$
<b>31.</b> $y = -3x - 10$ and $y = 3x + 2$	<b>32.</b> $y = 4x - 5$ and $y = -4x - 4$
<b>33.</b> $y = 2x$ and $y = 2x + 12$	<b>34.</b> $y = -3x - 4$ and $y = -3x$
<b>35.</b> $y = 15$ and $x = 12$	<b>36.</b> $x = -5$ and $y = 1$
Answers: <b>29.</b> perpendicular; <b>31.</b> neither; <b>33.</b> parallel; <b>35.</b> perpendicular	