

### Section 2.2b – Practice Problems

#### EMERGING LEVEL QUESTIONS

Fill in the blank with the appropriate word

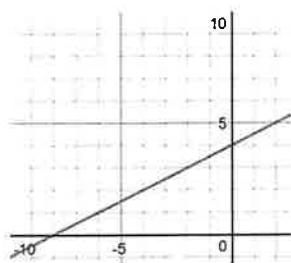
1. The run between two points on a coordinate system refers to change in the x variable
2. The rise between two points on a coordinate system refers to change in the y variable
3. The letter m is used to indicate the slope of a line
4. The formula for finding the slope of a line is  $\frac{y_2 - y_1}{x_2 - x_1}$
5. The slope of a vertical line is Undefined
6. The slope of a horizontal line is 0
7. A Positive has **both** the x-coordinates **and** y-coordinates increasing
8. A Negative has **either** the x-coordinates **or** y-coordinates decreasing
9. Slope represents a rate of change

10. Match the column on the left with the column on the right

- |  |   |
|--|---|
| <p>a) rise</p> <p>b) run</p> <p>c) slope</p> <p>d) vertical line</p> <p>e) horizontal line</p> | <p>i) <math>x = 3</math></p> <p>ii) difference in <math>x</math></p> <p>iii) <math>\frac{\text{difference in } y}{\text{difference in } x}</math></p> <p>iv) difference in <math>y</math></p> <p>v) <math>y = -1</math></p> |
|--|---|

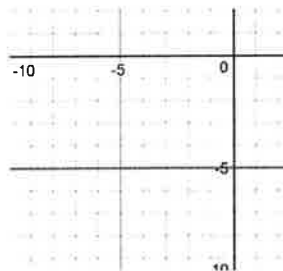
Determine if the slope is positive, negative, zero, or undefined.

11.



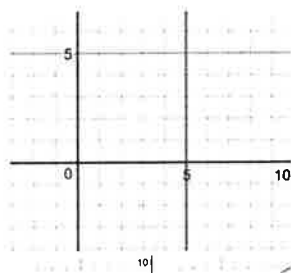
Positive

12.



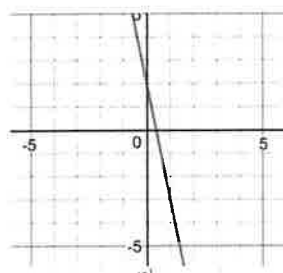
Zero

13.



Undefined

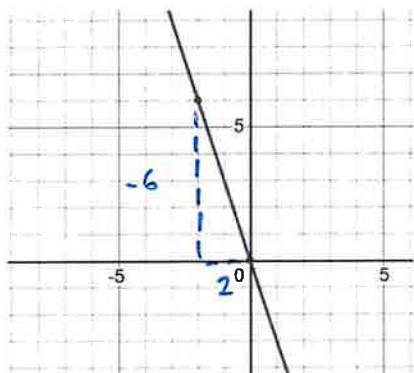
14.



Negative

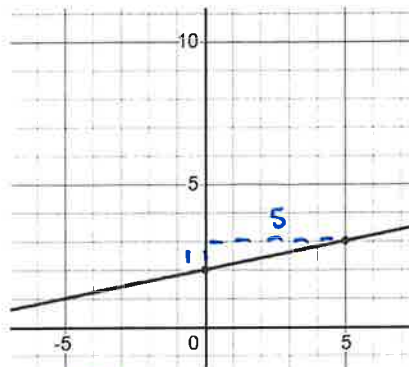
Determine the slope of the line

15.



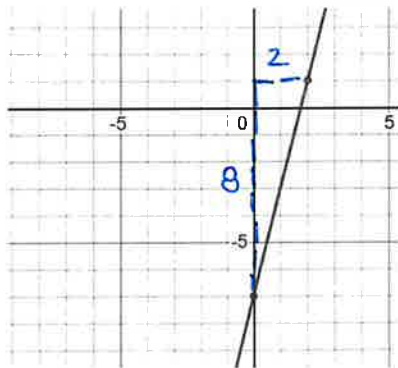
$$m = \frac{-6}{2} = \boxed{-3}$$

16.



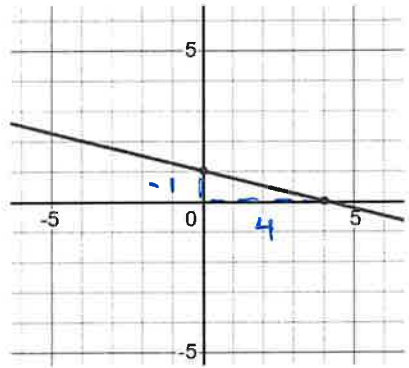
$$m = \frac{1}{5}$$

17.



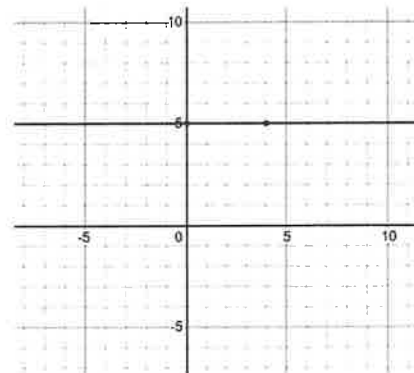
$$m = \frac{8}{2} = \boxed{4}$$

18.



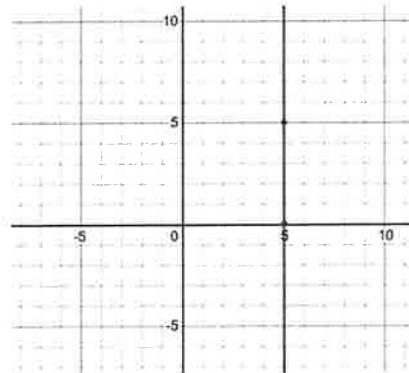
$$m = \frac{-1}{4}$$

19.



$$m = 0$$

20.



$$m = \text{undefined}$$

## PROFICIENT LEVEL QUESTIONS

Find the slope from the points provided

21. (2, 3) and (6, 9)

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

$$\frac{9-3}{6-2} = \frac{6}{4} = \boxed{\frac{3}{2}}$$

22. (3, 2) and (7, 10)

$$\frac{10-2}{7-3} = \frac{8}{4} = \boxed{2}$$

23. (-1, 5) and (4, 1)

$$\frac{1-5}{4-(-1)} = \boxed{\frac{-4}{5}}$$

24. (2, 2) and (2, -2)

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

no can do

undefined

25. (2, -1) and (-5, -1)

$$\frac{-1-(-1)}{-5-2} = \frac{0}{-7} = \boxed{0}$$

26. (-3, 1) and (6, 8)

$$\frac{8-1}{6-(-3)} = \boxed{\frac{7}{9}}$$

**EXTENDING LEVEL QUESTIONS**

27. A long-distance runner passes the 24km mark of a race in 1hr 20 min, and passes the 42km mark 1 hour later. Assuming a constant rate, find the speed of the long-distance runner in km/hr.

$$\frac{\text{km}}{\text{hr}} \leftarrow y \quad (1\text{h } 20\text{min}, 24\text{km}) \quad (2\text{h } 20\text{min}, 42\text{km})$$

$$\text{hr} \leftarrow x$$

$$\frac{42 - 24}{2\text{h } 20\text{min} - 1\text{h } 20\text{min}} = \boxed{18\text{km/hr}}$$

28. A plane at an altitude of 20 000 feet starts to descend for landing after flying for six hours. The entire flight time was 6 hours and 40 minutes. Determine the average rate of descent of the plane in ft/min.

$$\frac{\text{ft}}{\text{min}} \leftarrow y \quad (6\text{h}, 20000\text{ft}) \quad (6\text{h } 40\text{min}, 0)$$

$$\text{min} \leftarrow x$$

$$\frac{0 - 20000}{6\text{h } 40\text{min} - 6\text{h}} = \frac{-20000\text{ft}}{40\text{min}} = -500\text{ft/min}$$

means descending

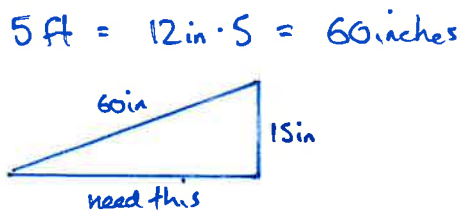
29. As a window washer begins work on a high rise with 120 windows, one-third of the windows were already clean. Eight hours later, three-quarters of all the windows are clean. Calculate the window washer's cleaning rate in windows per hour.

$$\frac{\text{windows}}{\text{hr}} \rightarrow \frac{90 - 40}{8 - 0}$$

$$\frac{50}{8} = \frac{25}{4} = \boxed{6.25\text{ windows/hr}}$$

(6h, 40 windows)  $120 \cdot \frac{1}{3} = 40$   
(8h, 90 windows)  $120 \cdot \frac{3}{4} = 90$

30. A five-foot-long treadmill rises 15 inches to make an incline for running. What is the slope of the treadmill?



$$\text{slope} = \frac{\text{rise}}{\text{run}} = \frac{15}{58.1} = \boxed{0.26\text{ in/inch}}$$

Pythagoras

$$60^2 - 15^2 = x^2$$

$$3600 - 225 = x^2$$

$$x = 58.1$$