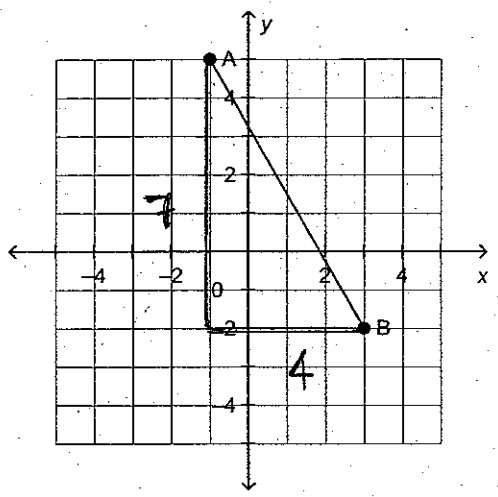


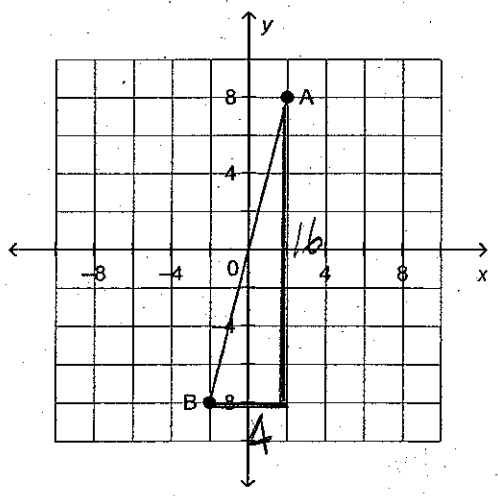
Math 10 - Ch.5 Linear Functions PRACTICE TEST /34

1. Determine the slope of this line segment.



• negative slope  $\searrow$   
 • rise = 7  
 • run = 4  
 $\therefore$  slope =  $-\frac{7}{4}$

2. Determine the slope of this line segment.



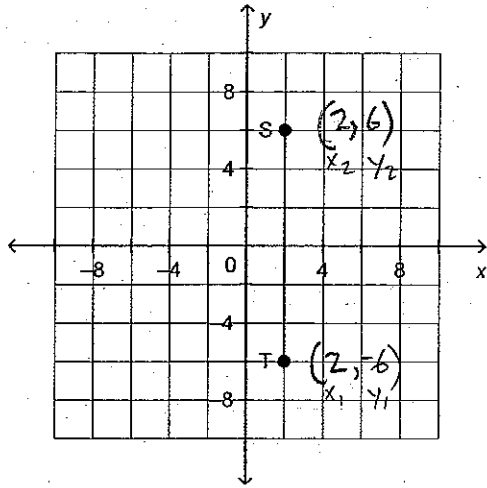
• positive slope  $\nearrow$   
 • rise = 16  
 • run = 4  
 • slope =  $\frac{16}{4} = 4$

3. A road drops 0.8 m for every 4.8 m measured horizontally. What is the rise of the road?

- a. -4.8      **b. -0.8**      c.  $-\frac{0.8}{4.8}$       d.  $-\frac{4.8}{0.8}$

4. The slopes of two lines are  $\frac{5}{8}$  and  $\frac{5}{8}$ . Are the two lines parallel, perpendicular, or neither?

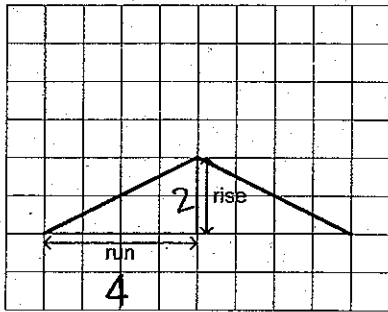
5. Is the slope of this line segment positive, negative, zero, or not defined?



not defined (see below for explanation)

- vertical lines have undefined slopes
- $m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{6 - (-6)}{2 - 2} = \frac{12}{0} = \text{undefined}$

6. Determine the steepness of this roof by calculating its slope. (Note: Steepness is always positive)



$$m = \frac{\text{rise}}{\text{run}} = \frac{2}{4} = \frac{1}{2}$$

- a.  $-\frac{1}{2}$     **b.  $\frac{1}{2}$**     c. 2    d. -2

7. Determine the slope of the line that passes through G(6, -3) and H(-3, 10).

Hint: Use  $m = \frac{y_2 - y_1}{x_2 - x_1}$

$x_1 \ y_1 \quad x_2 \ y_2$

$$m = \frac{10 - (-3)}{-3 - 6} = \frac{13}{-9}$$

8. A line has  $x$ -intercept 4 and  $y$ -intercept 8? Determine the slope of the line. Use  $m = \frac{y_2 - y_1}{x_2 - x_1}$

$$\begin{array}{cc} (4, 0) & (0, 8) \\ x_1 \ y_1 & x_2 \ y_2 \end{array}$$

$$m = \frac{8 - 0}{0 - 4} = \frac{8}{-4} = -2$$

9. Determine the slope of a line that is perpendicular to the line through  $W(-10, 5)$  and  $X(10, -10)$ .

Hint: Use  $m = \frac{y_2 - y_1}{x_2 - x_1}$

$$\begin{array}{cc} x_1 \ y_1 & x_2 \ y_2 \end{array}$$

$$m_{WX} = \frac{-10 - 5}{10 - (-10)} = \frac{-15}{20} = \frac{-3}{4}$$

$\therefore$  slope of  $\perp$  line is  $\frac{4}{3}$  (negative reciprocal)

10. The slope of a line is  $\frac{1}{4}$ . What is the slope of a line that is parallel to this line?

$$\frac{1}{4}$$

11. A line passes through  $J(-12, 6)$  and  $K(4, -5)$ . Determine the coordinates of  $L$  so that line  $JL$  is perpendicular to line  $JK$ . (Show your work) Hint: Use  $m = \frac{y_2 - y_1}{x_2 - x_1}$

a.  $L(16, -11)$   
 $x_2 \ y_2$

**b.**  $L(-1, 22)$   
 $x_2 \ y_2$

c.  $L(-11, 16)$   
 $x_2 \ y_2$

$$m_{JK} = \frac{-5 - 6}{4 - (-12)} = \frac{-11}{16}$$

CHECK:

a.  $m_{JL} = \frac{-11 - 6}{16 - (-12)} = \frac{-17}{38}$

b.  $m_{JL} = \frac{22 - 6}{-1 - (-12)} = \frac{16}{11}$

this is the negative reciprocal of  $-\frac{11}{16} \therefore$  it is  $\perp$

c. no need to check

12. The altitude of a plane,  $a$  metres, is related to the time,  $t$  minutes, that has elapsed since it started its ascent.

Determine the rate of change of this linear relation. **Hint: Use**  $m = \frac{y_2 - y_1}{x_2 - x_1}$

$t$ (min)	0	2	4	6	8
$a$ (m)	4000	5400	6800	8200	9600

$$\begin{matrix} (0, 4000) & (2, 5400) \\ x_1 & y_1 & x_2 & y_2 \end{matrix}$$

$$m = \text{rate of change} = \frac{5400 - 4000 \text{ m}}{2 - 0 \text{ min}} = \frac{1400 \text{ m}}{2 \text{ min}} = 700 \text{ m/min.}$$

13. A line passes through D(-5, 5) and N(7, -6). Determine the coordinates of two points on a line parallel to DN.

**Hint: Use**  $m = \frac{y_2 - y_1}{x_2 - x_1}$   $m_{DN} = \frac{-6 - 5}{7 - (-5)} = \frac{-11}{12}$

a. (10, -10) and (14, -12)  $m_a = \frac{-12 - (-10)}{14 - 10} = \frac{-2}{4} = \frac{-1}{2}$

b. (-10, 14) and (10, -12)  $m_b = \frac{-12 - 14}{10 - (-10)} = \frac{-26}{20} = \frac{-13}{10}$

c. (-10, 10) and (14, -12)  $m_c = \frac{-12 - 10}{14 - (-10)} = \frac{-22}{24} = \frac{-11}{12}$  same slope  $\therefore //$

d. (-10, 10) and (-12, 14)

14. The coordinates of the endpoints of segments are given below. Are the two line segments parallel, perpendicular, or neither? **Hint: Use**  $m = \frac{y_2 - y_1}{x_2 - x_1}$

**Hint: Use**  $m = \frac{y_2 - y_1}{x_2 - x_1}$

a) R(-1, 4), S(-6, -2) and T(3, -1), U(9, 4)

b) F(-7, -8), G(-4, 1) and V(-2, 5), W(7, 2)

a)  $m_{RS} = \frac{-2 - 4}{-6 - (-1)} = \frac{-6}{-5} = \frac{6}{5}$

$m_{TU} = \frac{4 - (-1)}{9 - 3} = \frac{5}{6}$

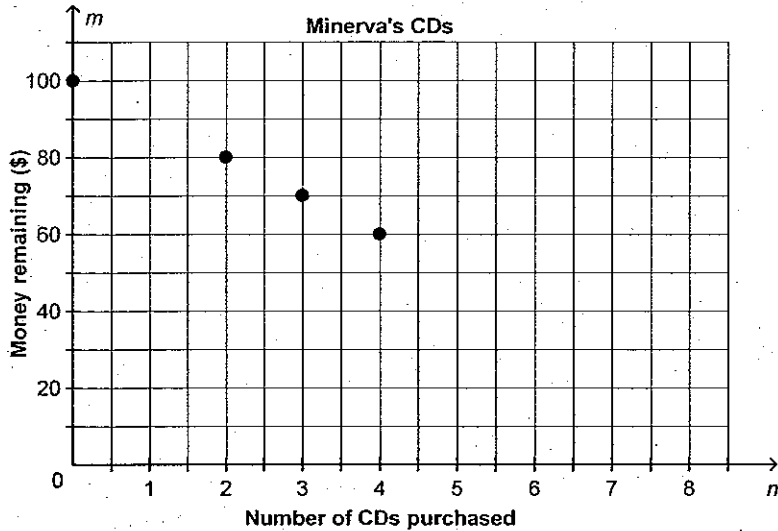
NEITHER

b)  $m_{FG} = \frac{1 - (-8)}{-4 - (-7)} = \frac{9}{3} = 3$

$m_{VW} = \frac{2 - 5}{7 - (-2)} = \frac{-3}{9} = -\frac{1}{3}$

PERPENDICULAR

15. Minerva has \$100. This graph represents the money Minerva would have if she purchased different numbers of CDs. Determine the rate of change of the relation. **Hint: Use  $m = \frac{y_2 - y_1}{x_2 - x_1}$**



I will use  $(0, 100)$  and  $(2, 80)$   
 $x_1 \quad y_1 \quad \quad \quad x_2 \quad y_2$

$$m = \frac{\$80 - \$100}{2 - 0 \text{ cd}} = \frac{-\$20}{2 \text{ cd}}$$

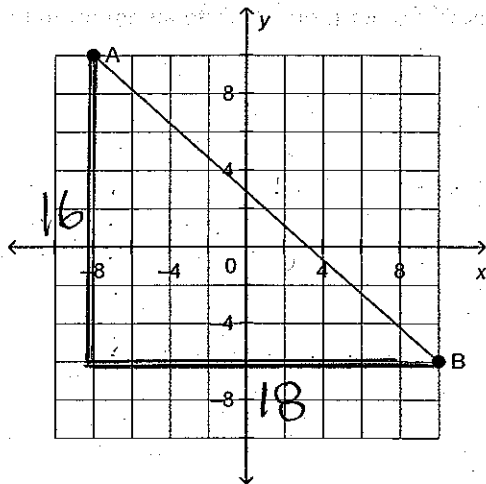
$$= \frac{-\$10}{\text{cd}}$$

- a. \$10/CD    b. -\$20/CD    **c. -\$10/CD**    d. \$25.00/CD

16. Determine the slope of this line segment.

**Hint: Use  $m = \frac{y_2 - y_1}{x_2 - x_1}$**

$A(-8, 10)$      $B(10, -6)$   
 $x_1 \quad y_1 \quad \quad \quad x_2 \quad y_2$



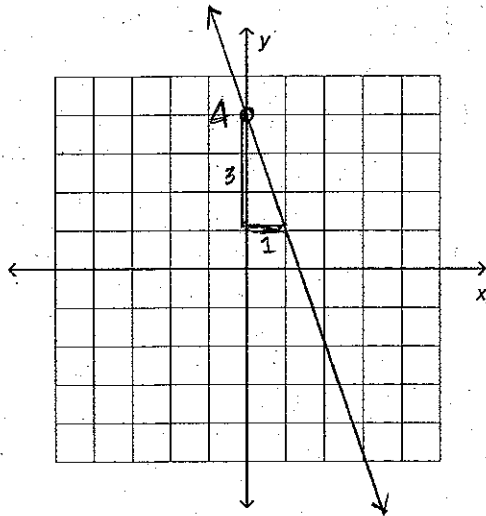
$$m = \frac{-6 - 10}{10 - (-8)} = \frac{-16}{18} = -\frac{8}{9}$$

OR

- slope is negative
- rise = 16
- run = 18

$$\frac{\text{rise}}{\text{run}} = \frac{-16}{18} = -\frac{8}{9}$$

17. Graph the line with y-intercept 4 and slope -3.



leans left

18. Determine the slope of the line that passes through  $(-15, -9)$  and  $(8, 19)$ . Hint: Use  $m = \frac{y_2 - y_1}{x_2 - x_1}$

$$m = \frac{19 - (-9)}{8 - (-15)} = \frac{28}{23}$$

$x_1 \ y_1 \quad x_2 \ y_2$

19. The total cost for a cheese of the month club is a flat fee of \$5, plus \$6.50 per month. Write an equation to represent the total cost,  $C$  dollars, for  $m$  months of membership.

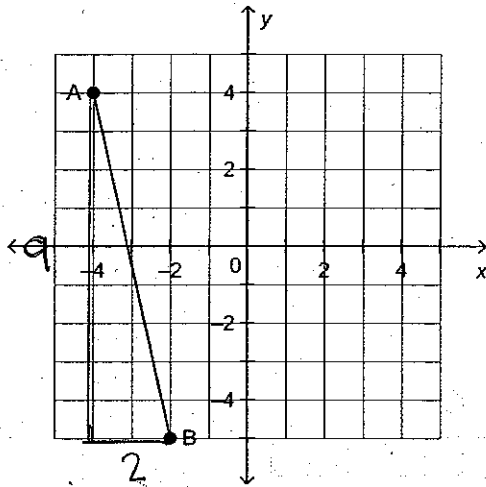
$$\$5 + \$6.50 \times (\# \text{ of months}) = \text{COST}$$

$$\therefore C = 6.5m + 5$$

20. a) Determine the rise, run, and slope of this line segment. (3 marks)

rise = 9, run = 2, slope =  $-\frac{9}{2}$

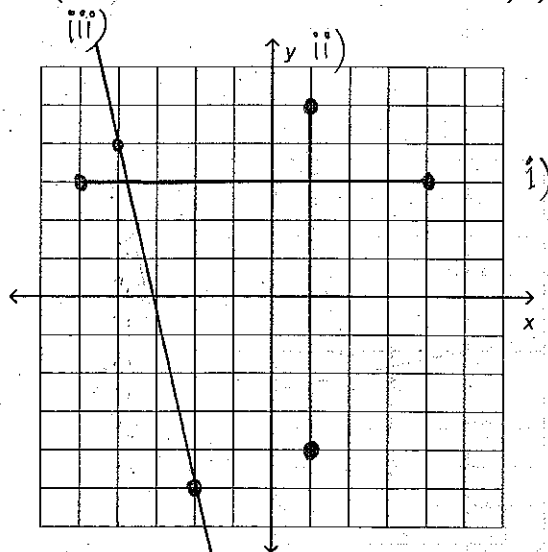
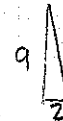
• negative because it leans left



b) Using a ruler, draw a line segment whose slope is:

- i) zero  $\longrightarrow$  any horizontal line
- ii) not defined  $\longrightarrow$  any vertical line
- iii) the same as the slope of the line segment in part a  $\longrightarrow$

(PLEASE LABEL EACH LINE as i, ii, and iii) (3 marks)



21. Identify the graph below that corresponds to each given slope and y-intercept. (2 marks)

a) slope  $-\frac{1}{5}$ ; y-intercept 0

Graph: D

b) slope  $-5$ ; y-intercept  $-4$

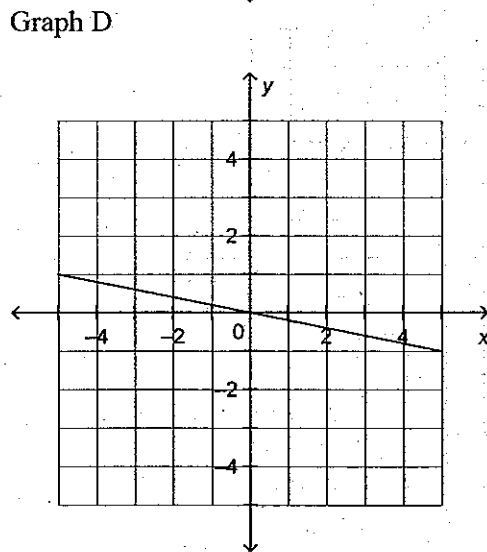
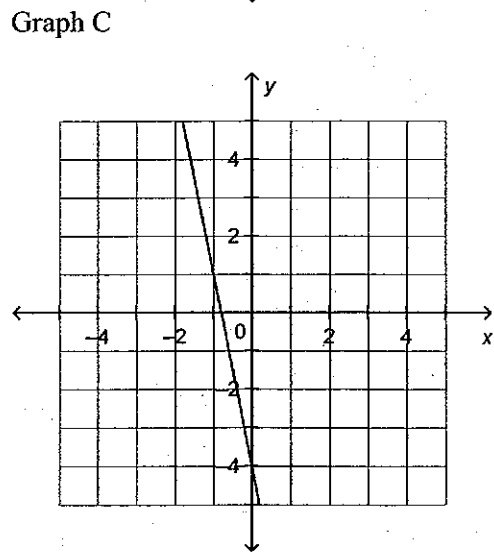
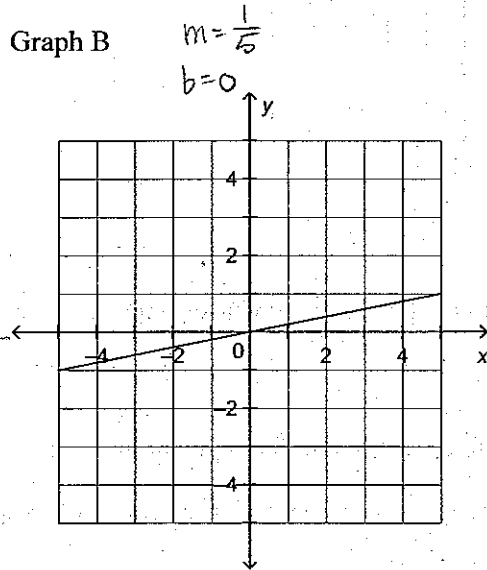
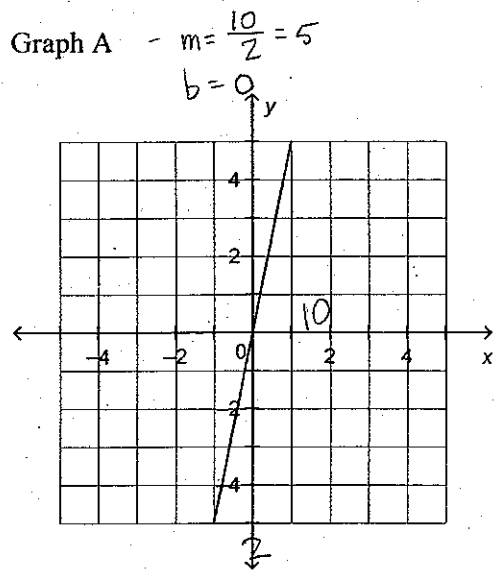
Graph: C

c) slope 5; y-intercept 0

Graph: A

d) slope  $\frac{1}{5}$ ; y-intercept 0

Graph: B



$b = -4$   
 $m = -5$

$b = 0$   
 $m = -\frac{1}{5}$



22. Francine runs a T-shirt company. For each order she receives, Francine charges a flat fee of \$35, plus \$8.95 per T-shirt. (3 marks)

$$35 + 8.95T$$

- a) Write an equation for the total cost,  $C$  dollars, for ordering  $n$  T-shirts.

$$C = 8.95n + 35$$

- b) Marnell ordered 57 T-shirts. What was the total cost?

$$C = 8.95(57) + 35$$

- c) Jakub paid a total cost of \$956.85. How many T-shirts did he order?

$$956.85 = 8.95n + 35$$

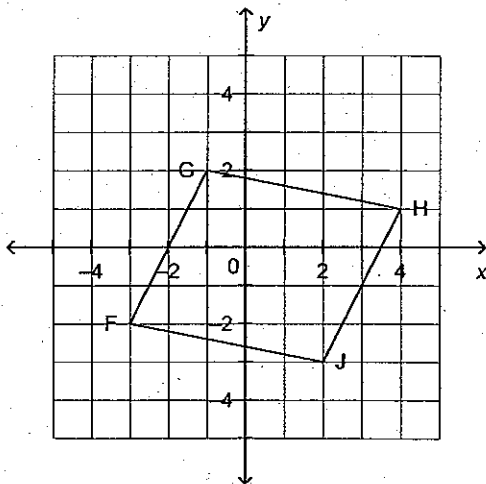
$$956.85 - 35 = 8.95n$$

$$921.85 = 8.95n$$

23. Reggie says  $FGHJ$  is a parallelogram. Ann says  $FGHJ$  is a rectangle. Who is correct? Justify your answer.

Hint: Use  $m = \frac{y_2 - y_1}{x_2 - x_1}$  (4 marks)

$$F(-3, -2) \quad G(-1, 2) \quad H(4, 1) \quad J(2, -3)$$



$$m_{FG} = \frac{2 - (-2)}{-1 - (-3)} = \frac{4}{2} = 2$$

$FG \parallel HJ$

$$m_{HJ} = \frac{-3 - 1}{2 - 4} = \frac{-4}{-2} = 2$$

$$m_{GH} = \frac{1 - 2}{4 - (-1)} = \frac{-1}{5}$$

$GH \parallel FJ$

$$m_{FJ} = \frac{-3 - (-2)}{2 - (-3)} = \frac{-1}{5}$$

REGGIE IS CORRECT SINCE THE PAIRS OF SIDES ARE NOT PERPENDICULAR TO THE OTHER PAIR

\*  $-\frac{1}{5}$  IS NOT A NEGATIVE RECIPROCAL OF 2