KEY

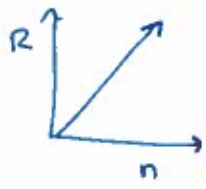
NAME

Math 10-C **Chapter 6 Review**

1) For each scenario, state the dependent variable, independent variable and the rate of change. Write the equation.

   a. The football team generates a revenue of R dollars by selling n football cards at $20 each.

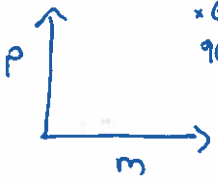
      i. The dependent variable is R.
      ii. The independent variable is n.
      iii. The rate is 20.
      iv. The equation is $R = 20n$.



   b. The number of pushups, p, Mr. Siemens can do in m minutes if he can do 15 in 10 seconds.

      i. The dependent variable is p.
      ii. The independent variable is m.
      iii. The rate is 90.
      iv. The equation is $p = 90m$.

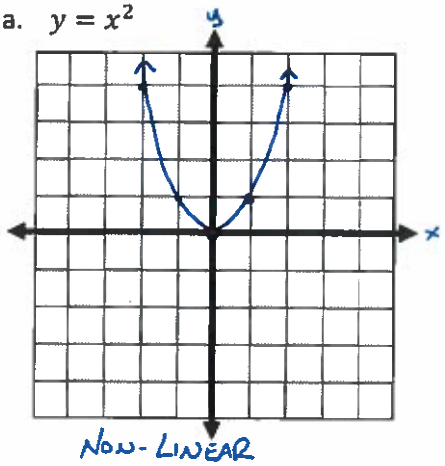
15 in 10 seconds
×6 ×6
90 in 60 seconds



2) For each relation, complete the table of values and draw the graph. State if the relation in linear or non-linear.

   a. $y = x^2$

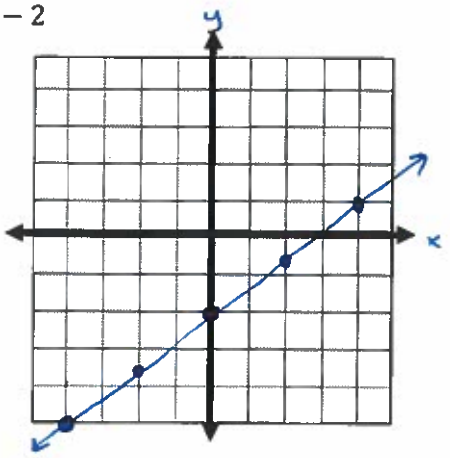
x	y
-2	4
-1	1
0	0
1	1
2	4



NON-LINEAR

   b. $y = \frac{3}{4}x - 2$

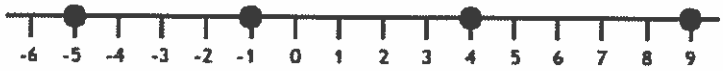
x	y
-4	-5
-2	-3.5
0	-2
2	-0.5
4	1



LINEAR

3) Write the domain of each number line.

   a.



Domain: $\{-5, -1, 4, 9\}$ ← List

   b.

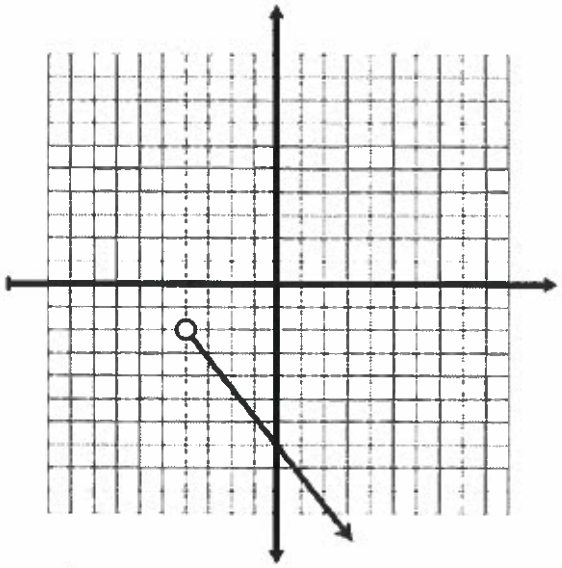
Domain: $(-\infty, -1)$ ← Interval Notation

Domain: $\{x \mid -\infty < x < -1, x \in \mathbb{R}\}$ or $\{x \mid x < -1, x \in \mathbb{R}\}$ ← Set Notation

KEY

4) Write the domain and range for each graph.

a.

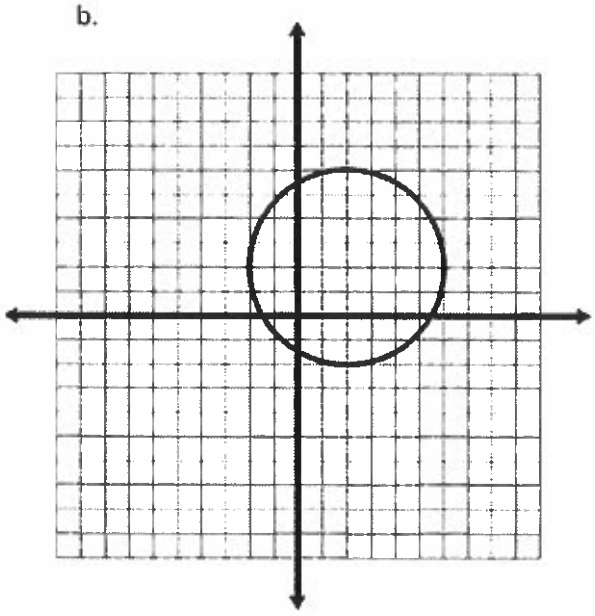


Set Notation

D: $\{x \mid -4 < x < \infty, x \in \mathbb{R}\}$

R: $\{y \mid -\infty < y < -2, y \in \mathbb{R}\}$

b.



Interval Notation

D: $[-2, 6]$

R: $[-2, 6]$

5) Identify if the following is a function or relation. Explain why.

a. {(2,3),(3,6),(4,10),(5,10)}

Function: For each value of x, only 1 unique value of y.

b.

x	f(x)
-4	16
-2	4
0	0
2	4
4	16

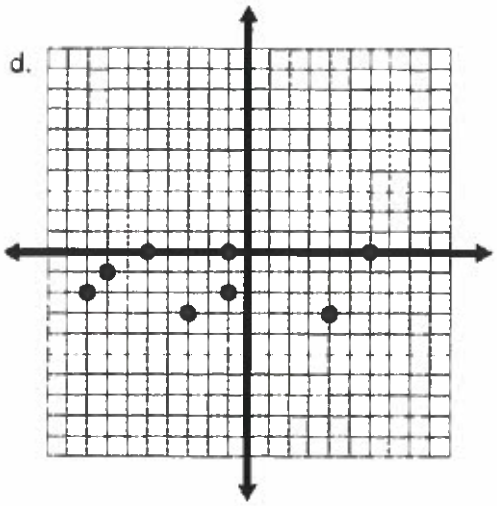
Function: For each value of x, only one unique value of y.

c.

x	f(x)
16	-4
4	-2
0	0
4	2
16	4

Relation. When x = 4, y can be both -2 and 2.

d.



Relation - Fails VERTICAL LINE TEST at x = -1.

KEY

6) For each function, calculate $f(-3)$.

a. $f(x) = -3x + 7$

$f(-3) = -3(-3) + 7$
$= 9 + 7$
$= 16$

b. $f(x) = \frac{4}{3}x - 2$

$f(-3) = \frac{4}{3}(-3) - 2$
$= -4 - 2$
$= -6$

c. $f(x) = x^2 - x$

$f(-3) = (-3)^2 - (-3)$
$= 9 + 3$
$= 12$

d. $f(x) = 2x^3 + 3x^2 - 2x + 10$

$f(-3) = 2(-3)^3 + 3(-3)^2 - 2(-3) + 10$
$= 2(-27) + 3(9) + 6 + 10$
$= -54 + 27 + 6 + 10$
$= -11$

7) Solve the following.

a. Given $d(t) = 4t + 5$, find t when $d(t) = 37$.

$37 = 4t + 5$
$-5 \quad -5$
$32 = 4t$

$32 = 4t$
$\div 4 \quad \div 4$
$\boxed{8 = t}$

b. Given $f(x) = -\frac{1}{2}x - 2$, the point $(k, 2)$ exists. Find k.

$(k, 2)$ → x, y

$2 = -\frac{1}{2}(k) - 2$
$+2 \quad +2$
$4 = -\frac{1}{2}(k)$

$4 = -\frac{1}{2}(k)$
$\cdot(-2) \quad \cdot(-2)$
$\boxed{-8 = k}$

c. Does the point $(12, -7)$ exist on the graph $f(x) = \frac{2x}{x-6} - 3$?

When $x = 12$, $y = ?$ (-7???)

$f(12) = \frac{2(12)}{(12)-6} - 3 = \frac{24}{6} - 3 = 4 - 3 = -1$

When $x = 12$, $y = -1$, NOT -7. This point does NOT exist on the graph.

d. The function $f(x) = 2x + k$ has a point $(4, 7)$. Find the value of k.

$(4, 7)$ → x, y

$7 = 2(4) + k$
$7 = 8 + k$
$-8 \quad -8$
$\boxed{-1 = k}$

8) For each pair of points calculate the slope.

a. (-3, 7) and (9,-1)
$x_1\ y_1 \quad x_2\ y_2$

$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{-1 - 7}{9 - (-3)} = \frac{-8}{12} = \boxed{-\frac{2}{3}}$

b. (10, -2) and (5, 4)
$x_1\ y_1 \quad x_2\ y_2$

$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{4 - (-2)}{5 - 10} = \frac{6}{-5} = \boxed{-\frac{6}{5}}$

c. (3, 7) and (-4, 6)
$x_1\ y_1 \quad x_2\ y_2$

$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{6 - 7}{-4 - 3} = \frac{-1}{-7} = \boxed{\frac{1}{7}}$

d. (-5,3) and (2,3)
$x_1\ y_1 \quad x_2\ y_2$

$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{3 - 3}{2 - (-5)} = \frac{0}{7} = \boxed{0}$

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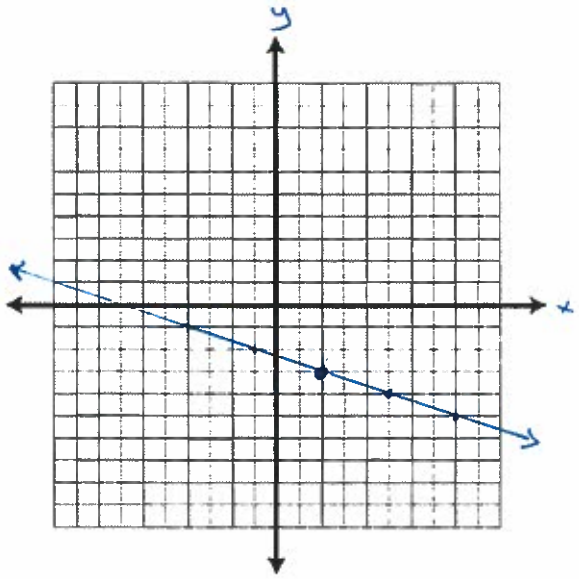
9) Draw each of the following lines.

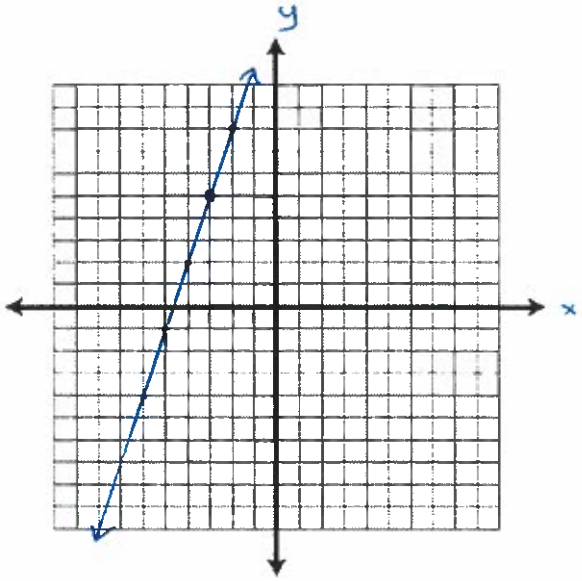
a. Slope = $-\frac{1}{3}$

Point (2,-3)



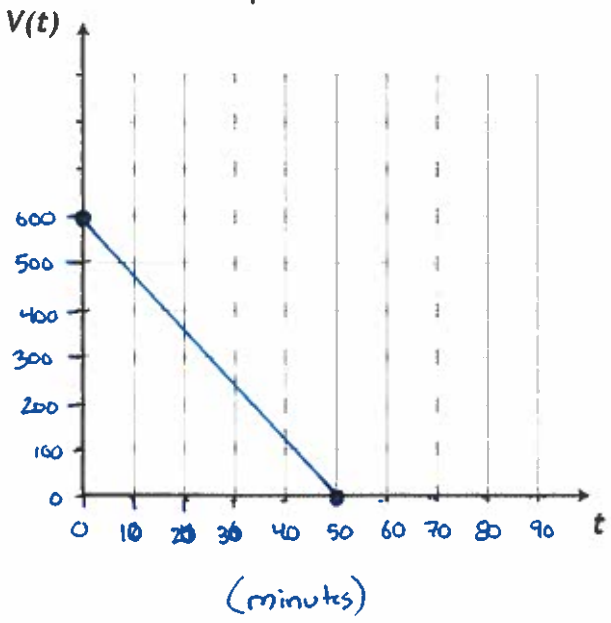
b. slope = 3

Point (-3, 5)



10) A cylindrical tank holding 600L of water can be drained at 12L/min.

a. Graph the volume of the tank.



b. Write a function to represent the scenario

$V = 600 - 12m$

c. What does each intercept represent?

y-intercept: Starting amount of water (L)

x-intercept: Time to have no water left (min

d. State the domain and range.

Domain: $[0, 50]$

Range: $[0, 600]$

e. When will the tank have 300L?

At 25 minutes.

f. When will the tank be empty?

At 50 minutes.