

**Chapter 5 Practice TEST**

1. For the following relations, determine if they are functions. Determine their domain and range and which variable is the independent/dependent one.

a)  $A = \pi r^2$  function ✓

$$D = [0, +\infty)$$

$$R = [0, +\infty)$$

$r$ : independent variable

$A$ : dependent variable

b)  $C = 5n + 30$  function ✓

$$D = \mathbb{R}$$

$$R = \mathbb{R}$$

$n$ : independent variable

$C$ : dependent variable

c) The salary,  $S$ , when you work  $t$  hours in a week, knowing that you are paid \$10/hour.

function ✓

$$D = [0, 50]$$

$$R = [0, 500]$$

$t$ : independent variable

$S$ : dependent variable

d) The price paid for ice creams if you invite up to 10 friends and each ice cream costs \$3.

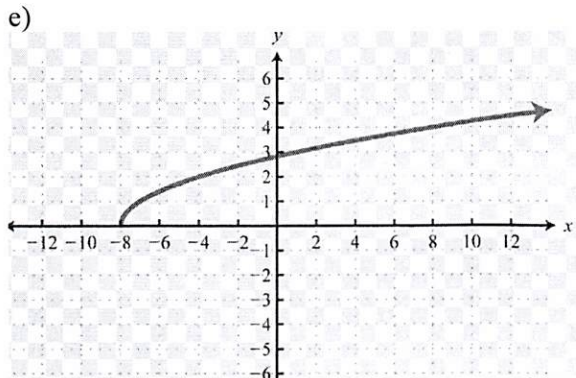
function ✓

$$D = \{1, 2, 3, \dots, 11\}$$

$$R = \{3, 6, 9, \dots, 33\}$$

number of ice creams: independent

price paid: dependent



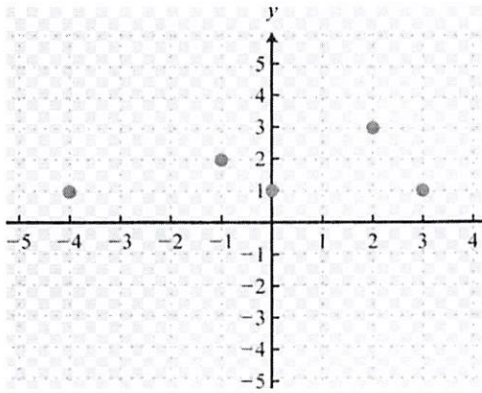
function ✓

$$D = [-8, +\infty)$$

$$R = [0, +\infty)$$

independent:  $x$

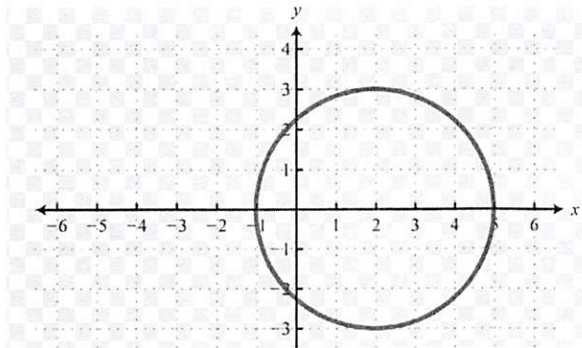
dependent:  $y$



function ✓

$$D = \{-4, -1, 0, 2, 3\}$$

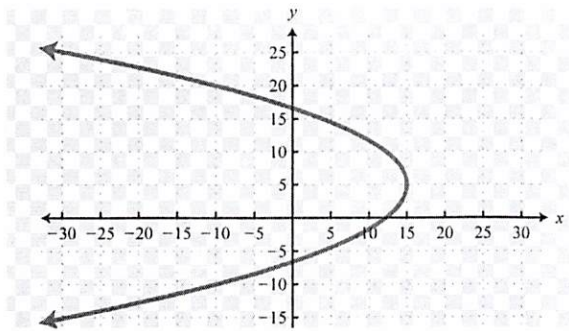
$$R = \{1, 2, 3\}$$



function ✗ (vertical line test)

$$D = [-1, 5]$$

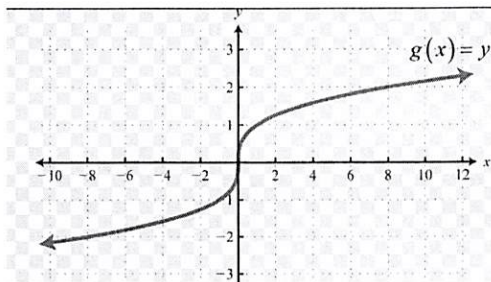
$$R = [-3, 3]$$



function ✗

$$D = (-\infty, 15]$$

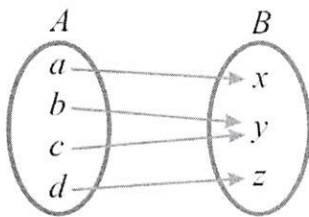
$$R = \mathbb{R}$$



function ✓

$$D = \mathbb{R}$$

$$R = \mathbb{R}$$



function ✓

$$D = \{a, b, c, d\}$$

$$R = \{x, y, z\}$$

independent : A

dependent : B

x	y
3	4
7	2
0	-1
-2	2
-5	0
3	3

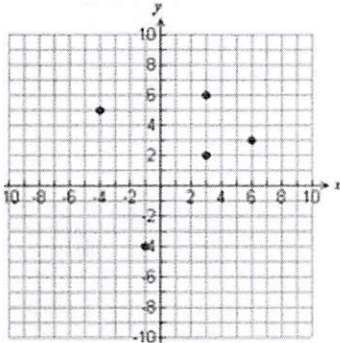
function  $x$  (3 is associated to 2 different values)

$$D = \{-5, -2, 0, 3, 7\}$$

$$R = \{-1, 0, 2, 3, 4\}$$

indep. var. :  $x$

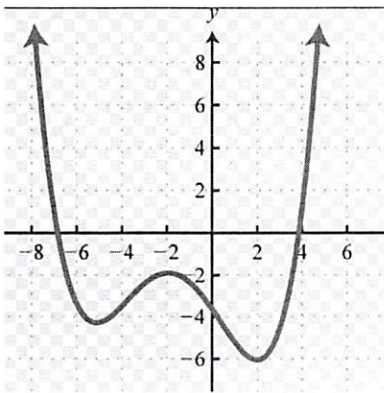
dep. var. :  $y$



function  $x$  (vertical line test)

$$D = \{-4, -1, 3, 6\}$$

$$R = \{2, 3, 5, 6\}$$



function  $\checkmark$

$$D = \mathbb{R}$$

$$R = [-6, +\infty)$$

2. Let  $f(x) = 3x - 5$ .

a) Determine  $f(-4) = 3(-4) - 5 = -12 - 5 = -17$

b) Determine  $f(5) = 3(5) - 5 = 15 - 5 = 10$

c) Determine  $x$  such that  $f(x) = 20$

$$3x - 5 = 20$$

$$3x = 25$$

$$x = \frac{25}{3}$$

d) What are the  $x$  and  $y$  intercepts?

$x$ -intercept:

$$3x - 5 = 0$$

$$3x = 5$$

$$x = \frac{5}{3}$$

$y$ -intercept:

$$y = 3(0) - 5$$

$$y = -5$$

3. Let  $f(x) = -x + 1$ .

a) Determine  $f(-3) = -(-3) + 1$   
 $= 3 + 1$   
 $= 4$

Determine  $f(5) = -5 + 1$   
 $= -4$

b) Determine  $x$  such that  $f(x) = -15$ ?

$-x + 1 = -15$   
 $-x = -16$   
 $x = 16$

c) What are the  $x$  and  $y$  intercepts?

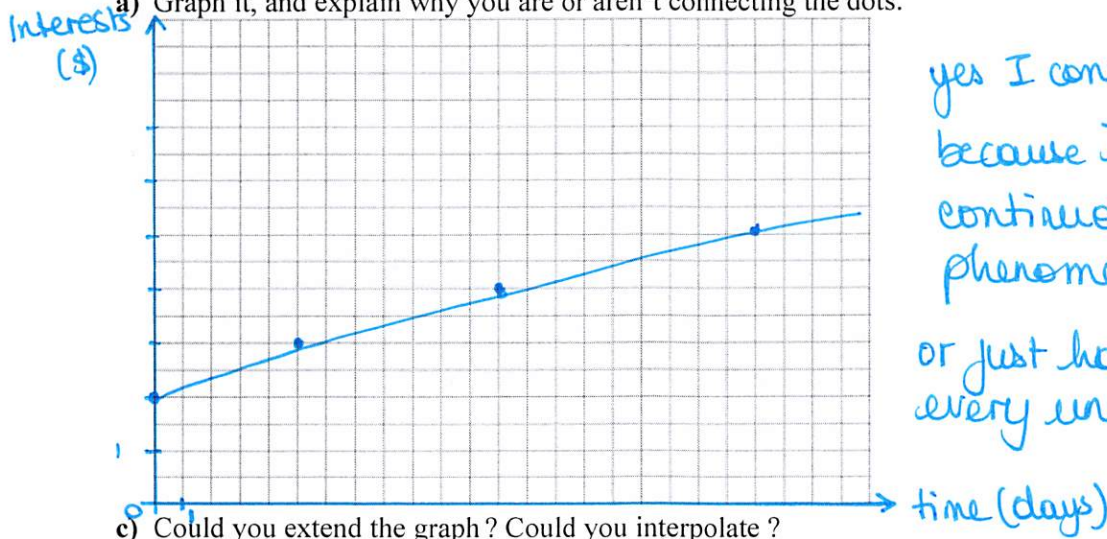
$x$ -intercept:  
 $0 = -x + 1$   
 $x = 1$

$y$ -intercept:  
 $y = -(0) + 1$   
 $y = 1$

4. Let's consider the following relation for the interests received in January this year:

Time (days)	Interest (\$)
0	2
5	3
12	4
21	5

a) Graph it, and explain why you are or aren't connecting the dots.



yes I connected the dots because it is a continuous phenomenon.

or just have a dot every unit for time.

c) Could you extend the graph? Could you interpolate?

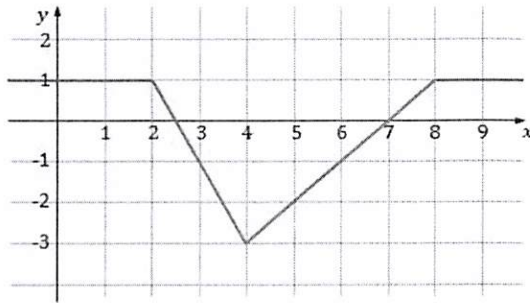
I could extend to the right (up to  $t = 31$ )  
 I could not extend to the left.  
 I could interpolate (between 2 dots)

d) Determine the domain and range.

$D = [0, 31]$   
 $R = [2, ?]$

would have to know the interests for 31 days.

5. Determine the following values from the graph of  $y = f(x)$  :



a)  $f(-1) = 1$

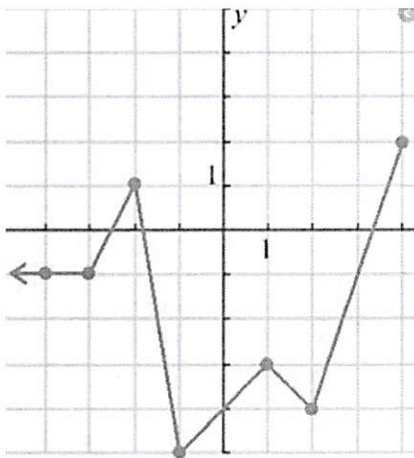
b)  $f(4) = -3$

c)  $f(1) = 1$

d) the value(s) of  $x$  such that  $f(x) = -1$

$x = 3$  or  $x = 6$

6. Determine the following values from the graph of  $y = f(x)$  :



a)  $f(2) = -4$

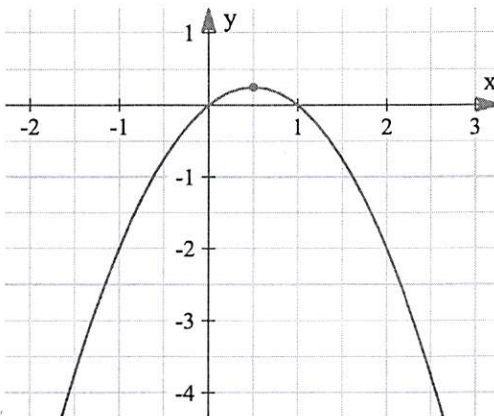
b)  $f(0) = -4$

c)  $f(-1) = -5$

d) the value(s) of  $x$  such that  $f(x) = 2$

$x = 4$

7.



a)  $f(2) = -2$

b)  $f(0) = 0$

c)  $f(-1) = -2$

d) the value(s) of  $x$  such that  $f(x) = 1$

none!

8. Alex sells organized day trips. She charges \$125 a day, plus \$55 more for each participant. Let  $n$  be the number of participants on a given day and  $P$  her benefit for that day.

a) Determine an equation for  $P$  as a function of  $n$ .

$$P = 125 + 55n$$

b) Write that equation in function notation.

$$P(n) = 55n + 125$$

c) Determine  $P(6)$ . What does it represent in this situation?

$$\begin{aligned} P(6) &= 55 \times 6 + 125 \\ &= 455 \end{aligned}$$

It's the benefit if there are 6 participants

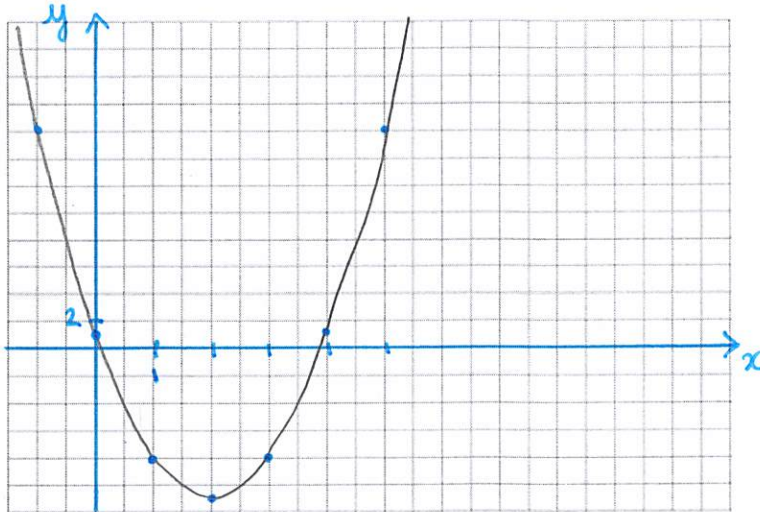
d) Determine  $n$  such that  $P(n) = 730$ . What does it represent in this situation?

$$\begin{aligned} 55n + 125 &= 730 \\ 55n &= 605 \\ n &= 11 \end{aligned}$$

It's the number of participants if the benefit is \$730.

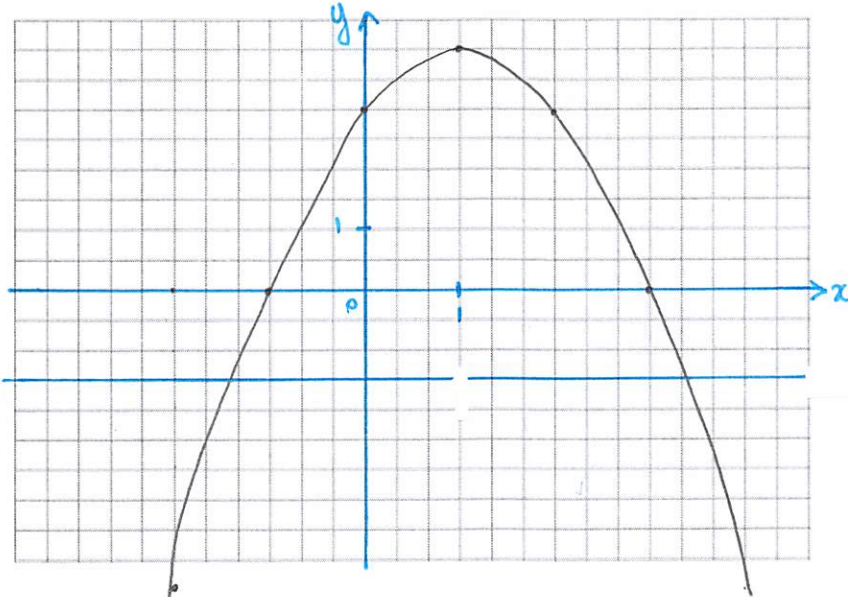
9. Complete the following table of values for:  $f(x) = 3x^2 - 12x + 1$  and then graph it.

$x$	0	1	2	3	4	5
$y$	1	-8	-11	-8	1	16

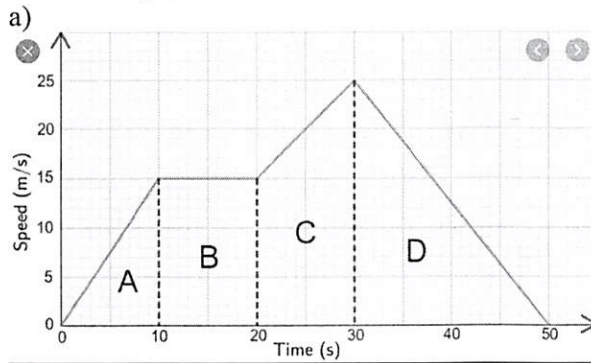


10. Complete the following table of values for:  $f(x) = -x^2 + 2x + 3$  and then graph it.

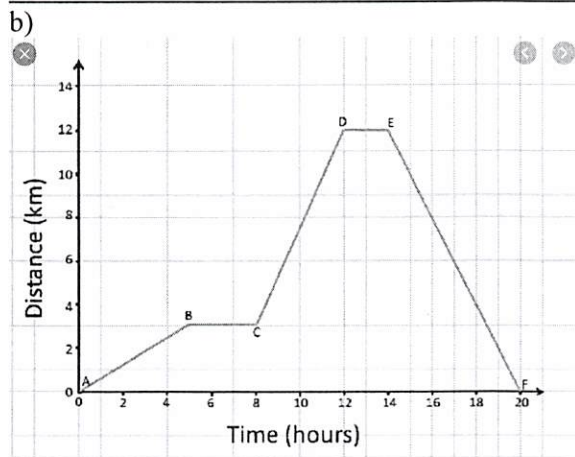
x	-2	-1	0	1	2	3
y	-5	0	3	4	3	0



11. Describe a possible scenario:



Gets started and accelerate for 10s, (A) then cruises at same speed for 10s, (B) then accelerates for 10s (C) Finally slows down until stop (D)



Gets started and cruises at same speed for 5 hours then stops for 3 hours. Starts again and cruises at same speed for another 4 hours. Then stops for 3 hours. And returns at a constant speed for 6 hours.