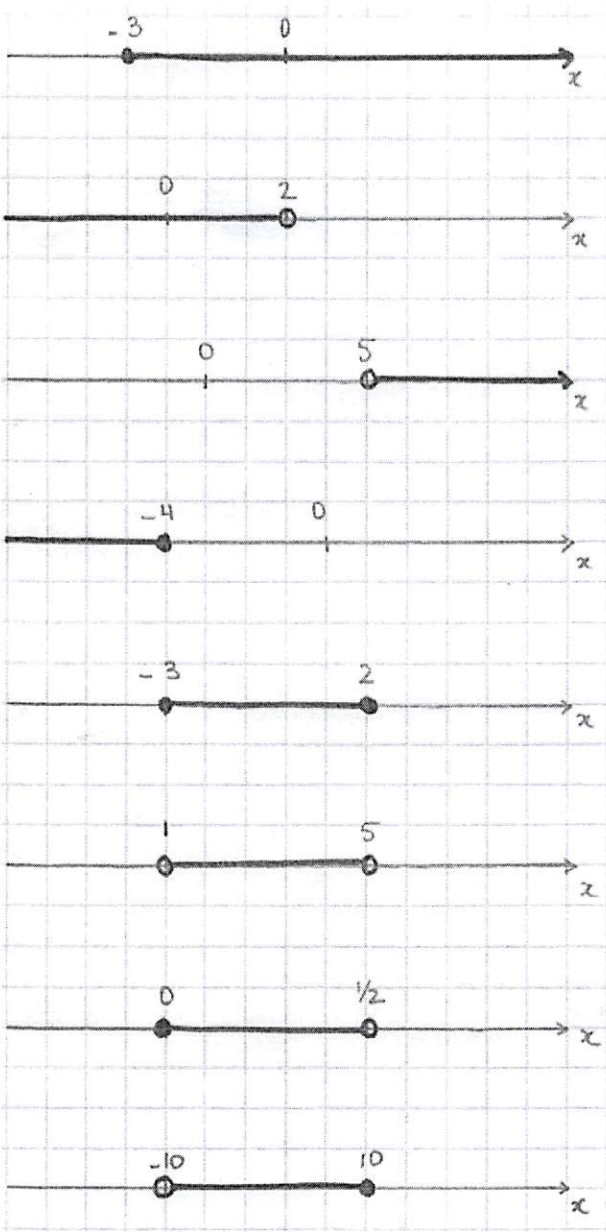


Functions Review - worksheet

1. Write these solutions as an interval or a set of values.



$[3; +\infty)$

$\{x \in \mathbb{R} \mid x \geq 3\}$

$(-\infty; 2)$

$\{x \in \mathbb{R} \mid x < 2\}$

$(5; +\infty)$

$\{x \in \mathbb{R} \mid x > 5\}$

$(-\infty; -4]$

$\{x \in \mathbb{R} \mid x \leq -4\}$

$[-3; 2]$

$\{x \in \mathbb{R} \mid -3 \leq x \leq 2\}$

$(1; 5)$

$\{x \in \mathbb{R} \mid 1 < x < 5\}$

$[0; \frac{1}{2})$

$\{x \in \mathbb{R} \mid 0 \leq x < \frac{1}{2}\}$

$(-10; 10]$

$\{x \in \mathbb{R} \mid -10 < x \leq 10\}$

2. Write as a set of values

a) $[5; 10]$

$\{x \in \mathbb{R} \mid 5 \leq x \leq 10\}$

b) $[2; 3[$

$\{x \in \mathbb{R} \mid 2 \leq x < 3\}$

c) $] -3; 5]$

$\{x \in \mathbb{R} \mid -3 < x \leq 5\}$

d) $]3; \infty[$

$\{x \in \mathbb{R} \mid x > 3\}$

3. Write as an interval.

a) $x < -3$ $(-\infty; -3)$

b) $x \leq 2$ $(-\infty; 2]$

c) $x > 5$ $(5; +\infty)$

d) $x \geq -1$ $[-1; +\infty)$

e) $-3 \leq x \leq 5$
 $[-3; 5]$

f) $1 \leq x < 3$
 $[1; 3)$

4. $f(x) = -5x + 10$, determine:

a) $f(3)$

$$f(3) = -5(3) + 10$$

$$f(3) = -5$$

b) the value of x for which $f(x) = -16$.

$$\begin{aligned} -5x + 10 &= -16 \\ -5x &= -26 \end{aligned}$$

$$x = \frac{-26}{-5}$$

$$x = \frac{26}{5}$$

ou $x = 5.2$

5. Determine what the dependent and independent variables are:

a) Volume of a sphere: $V = \frac{4}{3}\pi r^3$

↑ dependent ↑ independent

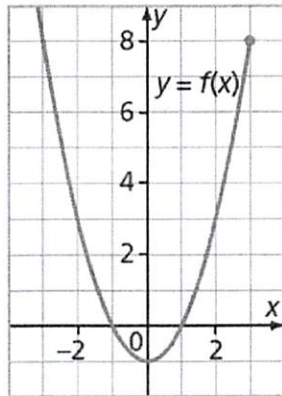
b) At the theatre, the price paid P and the number of tickets bought n .

↑ dependent ↑ independent

6. Determine the domain of the following relation: $\{(8; 10); (5; 7); (9; -11); (6; -8)\}$

$$D = \{5; 6; 8; 9\}$$

7. Determine :



Domain : $(-\infty; 3]$

Range : $[-1; +\infty)$

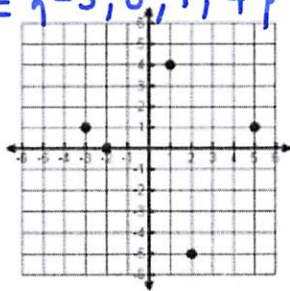
$f(0) = -1$ $f(-2) = 7$

Determine x so that $f(x) = 0$: $-1 \text{ \& } 1$

Determine x so that $f(x) = 8$: $-3 \text{ \& } 3$

8. Determine Domain, Range and if it's a function :

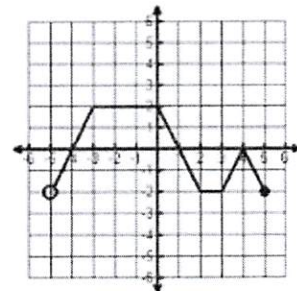
a) $D = \{-3; -2; 1; 2; 5\}$
 $R = \{-5; 0; 1; 4\}$



yes!

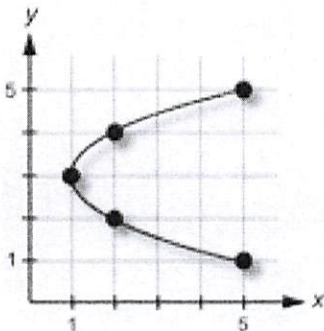
b)

$D = (-5; 5]$ $R = [-2; 2]$



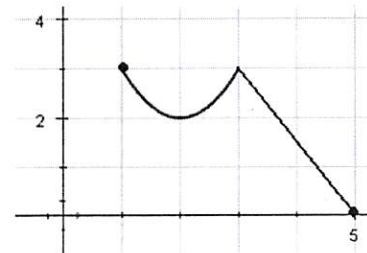
yes!

c)



$D = [1; 5]$
 $R = [1; 5]$
 no!

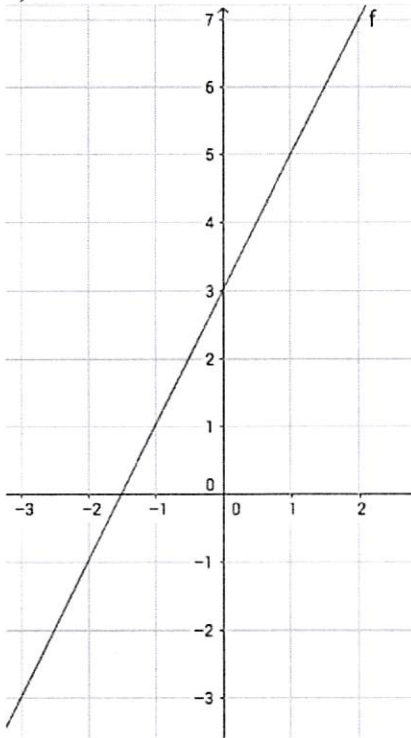
d)



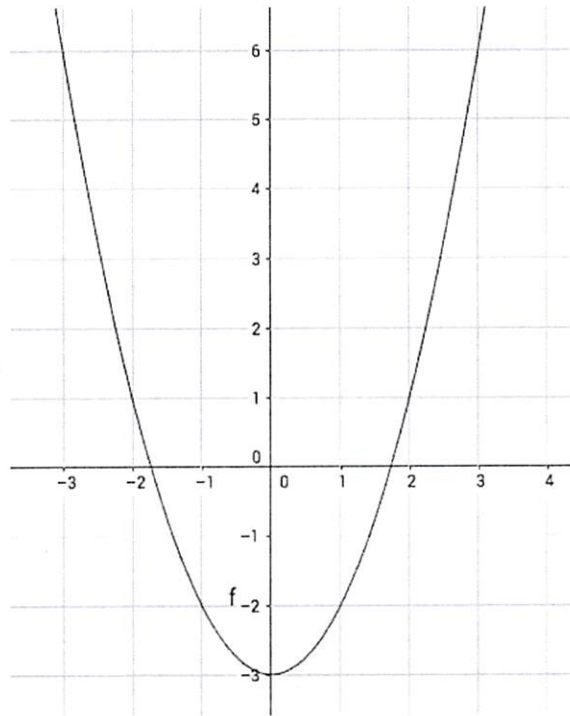
$D = [1; 5]$
 $R = [0; 3]$
 yes!

9. Fill the tables of values :

a)



b)



a)

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

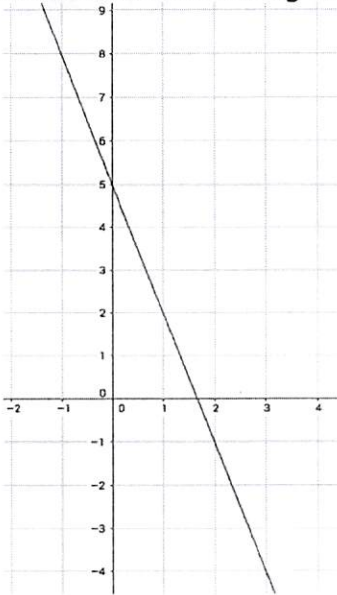
b)

x	-1	0	-2 or 2	-3 or 3
y	-2	-3	1	6

What are the intercepts ? (determine graphically, and approximate if need be)

a) x -intercept: -1.5
 y -intercept: 3

b) x -intercepts: -1.75 & 1.75
 y -intercept: -3

10. Determine the following values for f :

$$f(0) = 5$$

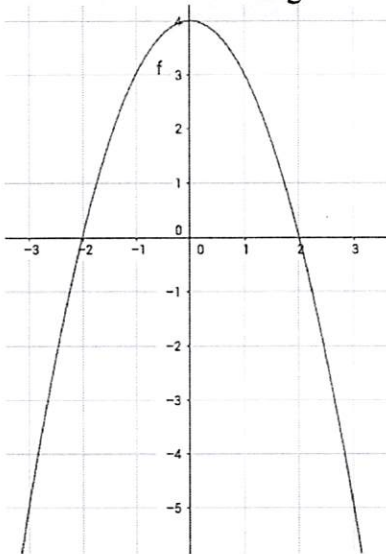
$$x \text{ such that } f(x) = -2$$

$$x \approx 2.3$$

$$f(1) = 2$$

$$x \text{ such that } f(x) = 8$$

$$x = -1$$

11. Determine the following values for f :

$$f(0) = 4$$

$$x \text{ such that } f(x) = 0$$

$$-2 \text{ \& } 2$$

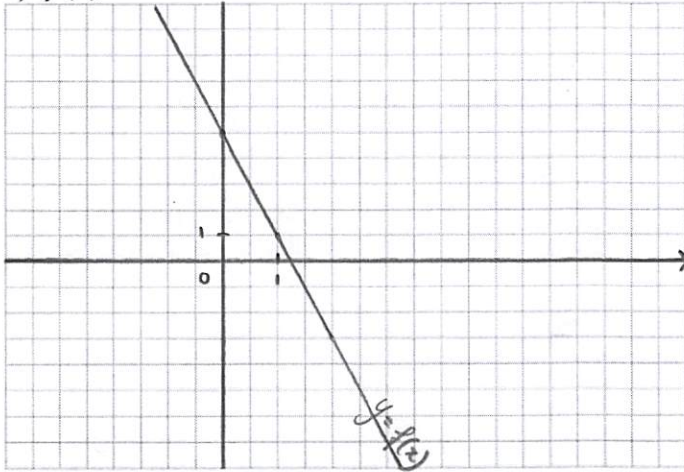
$$f(-1) = 3$$

$$x \text{ such that } f(x) = -5$$

$$-3 \text{ \& } 3$$

12. Graph the following functions and determine algebraically their intercepts:

a) $f(x) = -4x + 5$



a) linear: y -int: 5, slope: -4

if $x=0$: $y = -4(0) + 5$

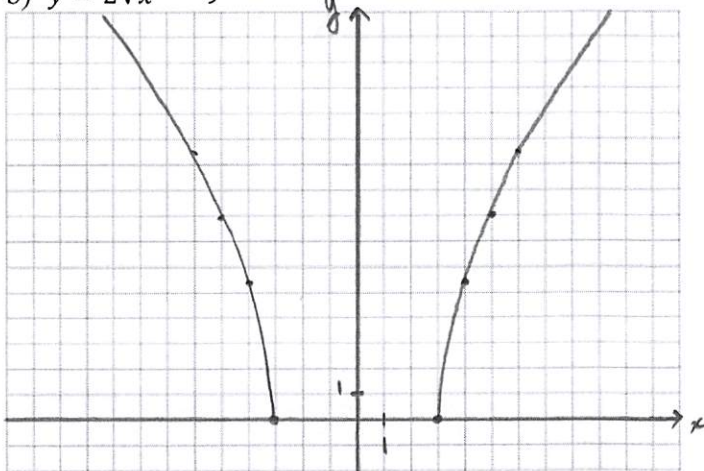
$y = 5$

if $y=0$: $0 = -4x + 5$

$-5 = -4x$

$x = \frac{5}{4}$

b) $y = 2\sqrt{x^2 - 9}$



b)

x	-6	-5	-4	-3	3	4	5	6
y	10.4	8	5.3	0	0	5.3	8	10.4

if $x=0$: $y = 2\sqrt{0^2 - 9}$

↑ impossible!

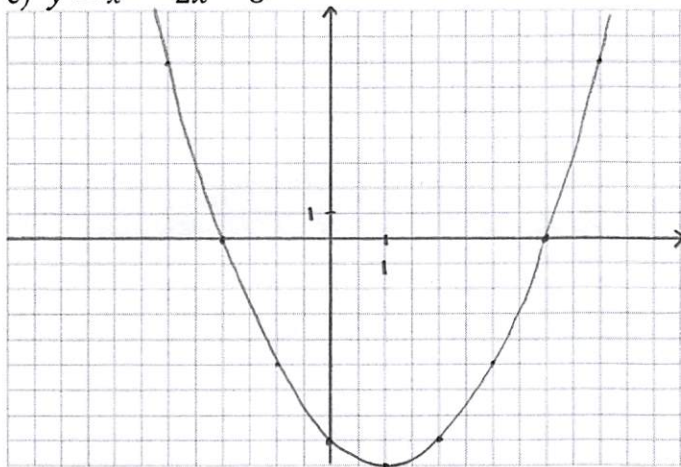
⇒ no y -intercept!

if $y=0$: $0 = 2\sqrt{x^2 - 9}$

$0 = \sqrt{x^2 - 9}$

$x = 3$ or $x = -3$

c) $y = x^2 - 2x - 8$



c)

x	-3	-2	-1	0	1	2	3	4	5	6
y	7	0	-5	-8	-9	-8	-5	0	7	16

if $x=0$: $y = -8$

if $y=0$: $x = -2$ or 4

↑
we don't know how to find this algebraically ---
Page 6 of 6
wait for chapter 4!