3. Draw the following parabolas.
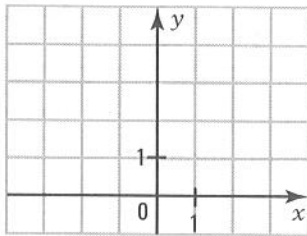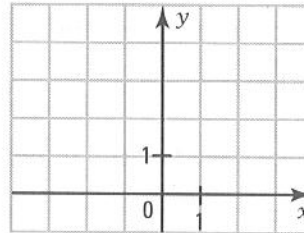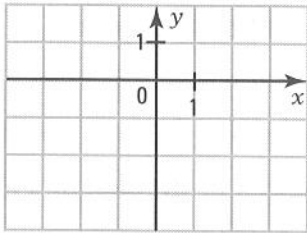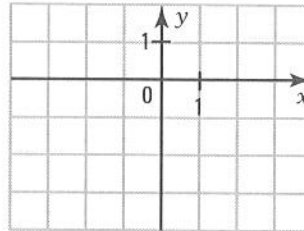
a) $y = 2x^2$

b) $y = \frac{1}{2}x^2$
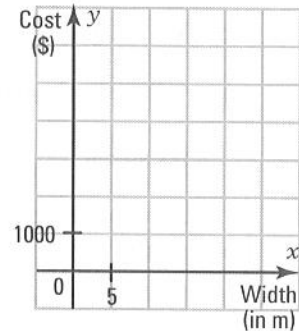

c) $y = -\frac{1}{4}x^2$

d) $y = -\frac{3}{2}x^2$

4. A rectangular field is twice as long as it is wide. Land is sold $10/m².

a) Find the rule of the function which associates the width x (in m) of the field with its cost C (in $).

_____

b) Draw the graph of this function.

c) If the field cost $8000, what will be the cost of putting a fence around it if each metre of fence costs $30? _____

5. A square-based prism has a height equal to 25 cm. Let x represent the length of the base's edge.

a) Find the rule of the function which associates the length of the base's edge with the volume V of the prism. _____

b) If the prism has its volume equal to 3600 cm³, what is the length of the base's edge? _____

c) What is the rule of the function which associates the volume V of a square-based prism

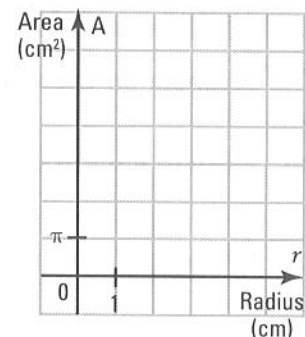with the length x of its base's edge? _____

6. Consider the function f which associates the radius r (in cm) of a disk with its area A (in cm²) .

a) Find the rule of function f. _____

b) Determine

    1. dom f. _____   2. ran f. _____

c) Represent function f in the Cartesian plane.

7. The distance d (in m) traveled by a free-falling object as a function of the time t (in sec) elapsed since it was dropped is described by the rule $d = 4.9\,t^2$.

a) Complete the table of values on the right.

t	0	1	2	3	4
d					

b) Calculate the average speed of the object between time

    1. 0 s and 1 s. _____   2. 1 s and 2 s. _____   3. 2 s and 3 s. _____   4. 3 s and 4 s. _____

c) Is the average speed of the object constant? What can you say about it?

_____

d) After how many seconds, rounded to the nearest unit, will the object hit the ground if it was dropped from a height of 180 m? _____

e) The speed v (in m/s) of the object at time t is described by the rule $v = 9.8\,t$. Determine, rounded to the nearest unit, the speed of the object when it hits the ground.

    1. In m/s. _____   2. In km/h. _____

8. A real estate agent is selling square-shaped lots. A lot with sides of length 25 m is sold $11 250.

a) What is the rule of the function which associates the length x of the side of a lot with its cost C (in $)? _____

b) What is the cost of a lot with sides of length 20 m? _____

c) What is the side length of a lot sold for $16 200? _____

d) What is the rule of the function which associates the cost C of a lot with the length x of

its sides? _____

9. A square-based pyramid has a height equal to 12 cm. Let x represent the length (in cm) of the base's edge and V its volume.

a) Find the rule of the function which associates the edge length x with the volume V. _____

b) Find the rule of the inverse function which associates the volume V with the edge length x.

_____

c) Determine
    1. the volume of the pyramid if the base's edge measures 10 cm. _____
    2. the length of the edge of the pyramid's base if its volume is equal to 100 cm³. _____

ACTIVITY 6 Finding the rule $y = ax^2$

The parabola on the right has vertex V(0, 0) and passes through the point A(2, 6).

a) Explain how to find the equation of the parabola. _____

_____

b) Find the equation of the parabola.

_____