



3. Let  $P = (x, y)$  be a point on the graph of  $y = x^2 - 8$ .

a) Express the distance,  $d$ , from  $P$  to the origin as a function of  $x$ .

b) What is  $d$  if  $x = 0$ ?

c) What is  $d$  if  $x = 1$ ?

d) Graph.

e) For what values is  $d$  smallest?

4. David has available 400 yards of fencing and wishes to enclose a rectangular area.
- Express the area,  $A$ , of the rectangle as a function of the width,  $x$ , of the rectangle.
  - What is the domain of  $A$ ?
  - Graph  $A = A(x)$ .  
For what value of  $x$  is the area largest?

5. A rectangle has one corner on the graph of  $y = 16 - x^2$ , another at the origin, a third on the positive  $y$ -axis and a fourth on the positive  $x$ -axis.
- Express the area,  $A$ , of the rectangle as a function of  $x$ .
  - What is the domain of  $A$ ?
  - Graph  $A = A(x)$
  - For what values is  $A$  the largest?

6. A wire 10 meters long is to be cut into two pieces. One piece will be shaped as a square and the other piece will be shaped as a circle.
- a) Express the total area,  $A$ , enclosed by the pieces of wire as a function of the length,  $x$ , of a side of the square.
- b) What is the domain of  $A$ ?
- c) Graph.  
For what value is  $A$  smallest?

7. A wire of length  $x$  is bent into the shape of a circle.
- a) Express the circumference of the circle as a function of  $x$ .
- b) Express the area of the circle as a function of  $x$ .