



2018 Year 11 math topic test: Relations and functions © itute 2018

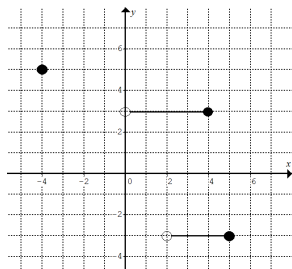
The questions in this test use the following representations:

- *a point which is not part of the relation/function*
- *a point which is part of the relation/function*
- *a solid line/curve which is part of the relation/function*
- - - *a dotted line/curve which is not part of the relation/function*
- *a shaded region which is part of the relation/function*

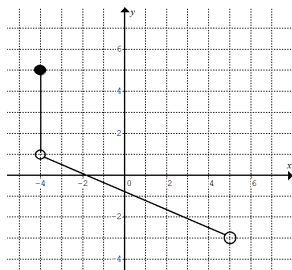
Q1 One-to-one relation; many-to-one function; one-to-many function; one-to-many relation; many-to-many function; many-to-many relation.

Choose one of the above descriptions for each relation below. State the domain and range of each one.

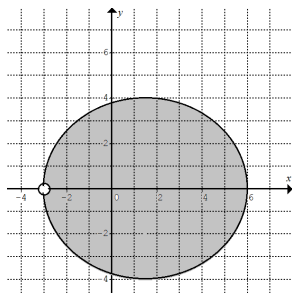
a. 3 marks



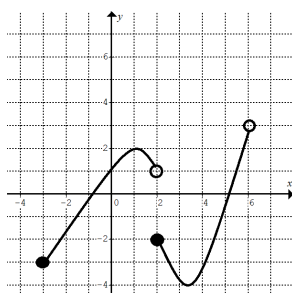
b. 3 marks



c. 3 marks



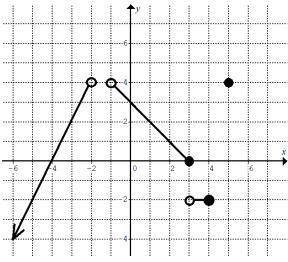
d. 3 marks





Q2 Determine the equation/s of the hybrid (also known as piece-wise) function shown below.

6 marks



Q3 State the implied domain and range of each relation below.

a. $y = \frac{10^{10}}{(x+1)^2}$

2 marks

b. $y = 1 - \sqrt{1-x}$

2 marks

c. $y = \sqrt{x^2 + 2x + 1}$

2 marks

d. $(1+x)^2 + (1-y)^2 = 1$

2 marks

e. $y = 2(1-x)(3+x)$

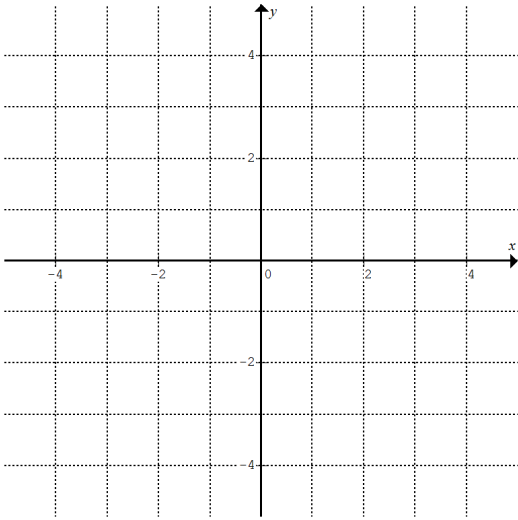
2 marks



Q4 Sketch the graph of each relation/function below. Show coordinates of end points, turning points, asymptotes and axis-intercepts if they exist.

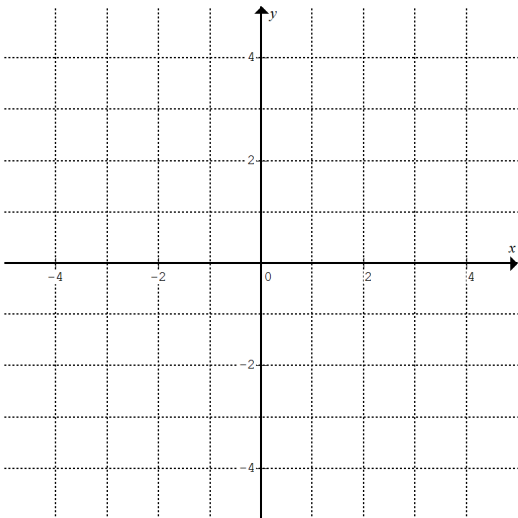
a. $f : (1, 4] \rightarrow R, f(x) = \sqrt{x} - 2$

3 marks



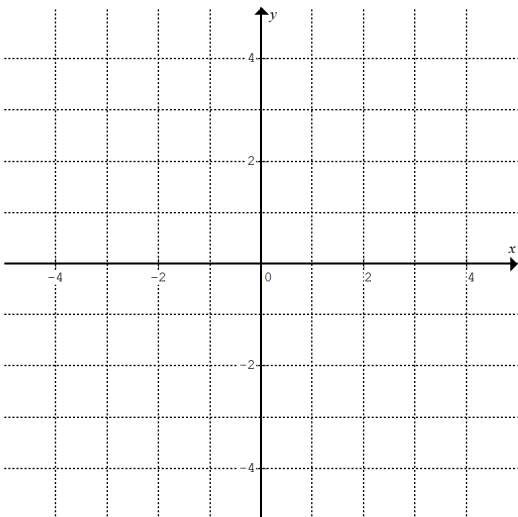
b. $\{(x, y) : x^2 + y^2 - 2y - 3 = 0, x \in R\}$

3 marks



c. $g : (0, 2) \rightarrow R, g(x) = \frac{-4}{x+2}$

3 marks

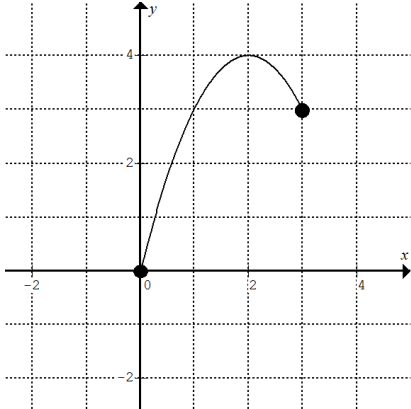




Q5 The graph of $f : [0, 3] \rightarrow \mathbb{R}$, $f(x) = -x(x-4)$ is shown below.

a. On the same set of axes sketch accurately the graph of the inverse of f .

2 marks



b. Write down the domain and range of the inverse of f .

2 marks

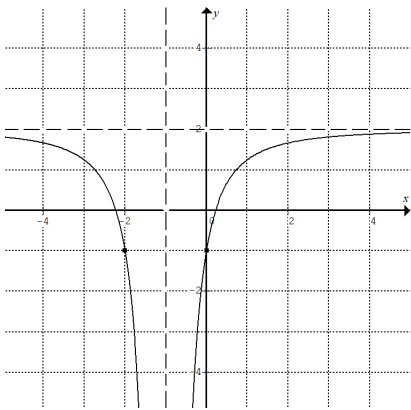
c. Determine the equation of the inverse of f . Express y in terms of x .

3 marks

Q6 Determine the equation of each relation below.

a.

3 marks



b.

3 marks

