

EXERCISE 3A

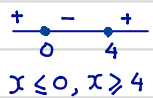
7a  $x \geq 0$

b  $-x \geq 0$   
 $x \leq 0$

c  $x-4 \geq 0$   
 $x \geq 4$

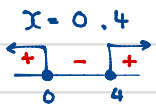
d  $4-x \geq 0$   
 $x \leq 4$

e  $x(x-4) \geq 0$



$x \leq 0, x \geq 4$

f.  $2x(x-4) \geq 0$



$x \leq 0, x \geq 4$

g.  $x^2-7x+12 \geq 0$

$(x-3)(x-4) \geq 0$

$x = 3, 4$



$x \leq 3, x \geq 4$

h.  $x^3-8 \geq 0$

$x^3 \geq 8$

$x \geq \sqrt[3]{8}$

$x \geq 2$

i.  $x \neq 2, x \in \mathbb{R}$

j.  $x-2 > 0$

$x > 2$

k.  $x > 0$

l.  $x \neq 1, x \neq 2, x \in \mathbb{R}$

8. Domain:  $x > 0$

a.  $f(x) > 7$

$f(x) = 2x+7,$

$x > 0, 2x > 0$

$2x+7 > 7$

$f(x) > 7$

b.  $f(x) < 0$

c.  $f(x) > -1$

d.  $f(x) > -1$

e.  $f(x) > 3$

f.  $f(x) = (x-1)^2+2$

vertex  $(1, 2) \rightarrow$  min value = 2  
at  $x = 1$

$f(x) \geq 2$

ga  $f(x) \geq 4$

b.  $f(x) \geq 10$

c.  $f(x) \geq 6$

d.  $f(x) \leq 7$

e.  $f(x) \geq 2$

f.  $f(x) \geq -1$

11 a  $x \in \mathbb{R}, f(x) \geq 0$

b  $x \in \mathbb{R}, f(x) \in \mathbb{R}$

c  $x \neq 0, f(x) \neq 0$

d  $x \neq 0, f(x) > 0$

e.  $x \in \mathbb{R}, f(x) \geq 5$

f.  $x \in \mathbb{R}, f(x) \in \mathbb{R}$

g.  $-2 \leq x \leq 2, 0 \leq f(x) \leq 2$

h.  $x \leq 4, f(x) \geq 0$

10 a  $0 \leq x \leq 8$

$f(x) = 2x$

$f(0) = 0, f(8) = 16$

Range:  $0 \leq f(x) \leq 16$

b.  $-2 \leq x \leq 2$

$f(x) = 3-2x$

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

Range:  $-1 \leq f(x) \leq 7$

c.  $-1 \leq x \leq 4$

$f(x) = x^2 \rightarrow$  min value

vertex  $(0, 0)$

$f(-1) = 1, f(4) = 16$

$0 \leq f(x) \leq 16$

d.  $-5 \leq x \leq -2$

$f(x) = x^2$

$f(-5) = 25, f(-2) = 4$

$4 \leq f(x) \leq 25$

12 length =  $12-w$

$A = w \times (12-w)$

$= 12w - w^2 = -[w^2 - 12w]$

$= -[(w-6)^2 - 36] = 36 - (w-6)^2$

$= 36 - (6-w)^2$

Domain:  $0 < w < 12$

Range:  $0 < A \leq 36$

13.  $0 < x < 4$