

2. FUNCTIONS AND GRAPHS

2.1 COMPOSITE FUNCTIONS

$$(a) f(g(x)) = 2x^2 - 5$$

$$(b) g(h(x)) = 6 - 2(3x - 9) \\ = -6x + 24$$

$$(c) m(k(x)) = 2(5x+1)^2 - (5x+1) \\ = 2(25x^2 + 10x + 1) - 5x - 1 \\ = 50x^2 + 15x + 1$$

2.2 INVERSE FUNCTIONS

$$(a) y = 2x - 5$$

$$y + 5 = 2x$$

$$\frac{y+5}{2} = x$$

$$\Rightarrow \underline{\underline{f^{-1}(x) = \frac{x+5}{2}}}$$

$$(b) y = 5x^2 - 3$$

$$y + 3 = 5x^2$$

$$\frac{y+3}{5} = x^2$$

$$\sqrt{\frac{y+3}{5}} = x$$

$$\Rightarrow \underline{\underline{p^{-1}(x) = \sqrt{\frac{x+3}{5}}}}$$

$$(c) y = \sqrt{6x - 10}$$

$$y^2 = 6x - 10$$

$$y^2 + 10 = 6x$$

$$\frac{y^2 + 10}{6} = x$$

$$\Rightarrow \underline{\underline{k^{-1}(x) = \frac{x^2 + 10}{6}}}$$

2.3 DOMAINS

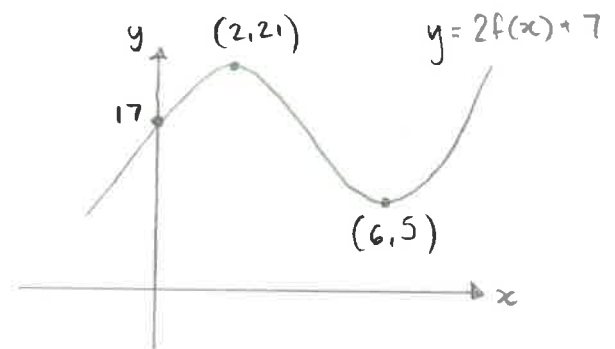
(a) Undefined when $3x - 9 = 0$
 $3x = 9$
 $x = 3$

(b) Undefined when $6x - 10 < 0$
 $6x < 10$
 $x < \frac{5}{3}$

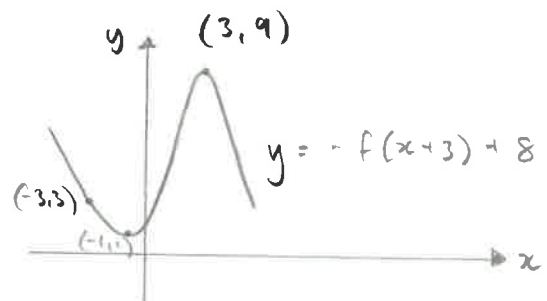
(c) Undefined when $x^2 - 25 = 0$
 $(x+5)(x-5) = 0$
 $x = -5$ $x = 5$

2.4 GRAPH TRANSFORMATIONS

(a) $(0, 5) \rightarrow (0, 17)$
 $(2, 7) \rightarrow (2, 21)$
 $(6, -1) \rightarrow (6, 5)$



(b) $y = -f(x+3) + 8$
 $(0, 5) \rightarrow (-3, 3)$
 $(2, 7) \rightarrow (-1, 1)$
 $(6, -1) \rightarrow (3, 9)$



(c) $(0, 5) \rightarrow (0, 10)$
 $(2, 7) \rightarrow (-2, 12)$
 $(6, -1) \rightarrow (-6, 4)$

