

2005

Question 6

Q6 (a) Find the solution set of the inequality: $6 - 2x \leq 12$, $x \in R$.

(b) Let f be the function $f: x \rightarrow 5 - 3x - 2x^2$ and g be the function $g: x \rightarrow -2x - 1$.

Using the same axis and scales, draw the graph of f and of g , for $-3 \leq x \leq 2$, $x \in R$.

(c) Use your graph from part (b) to estimate:

- (i) the maximum value of $f(x)$
- (ii) the values of x for which $f(x) = g(x)$
- (iii) the range of values of x for which $f(x) \geq g(x)$.

Solution

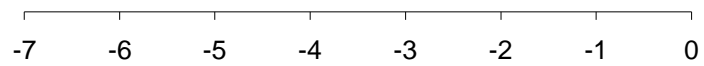
Q6 (a) Find the solution set of the inequality: $6 - 2x \leq 12$, $x \in R$.

$$6 - 2x \leq 12$$

$$-2x \leq 6$$

$$2x \geq -6$$

$$x \geq -3$$



(b) Let f be the function $f: x \rightarrow 5 - 3x - 2x^2$ and g be the function $g: x \rightarrow -2x - 1$.

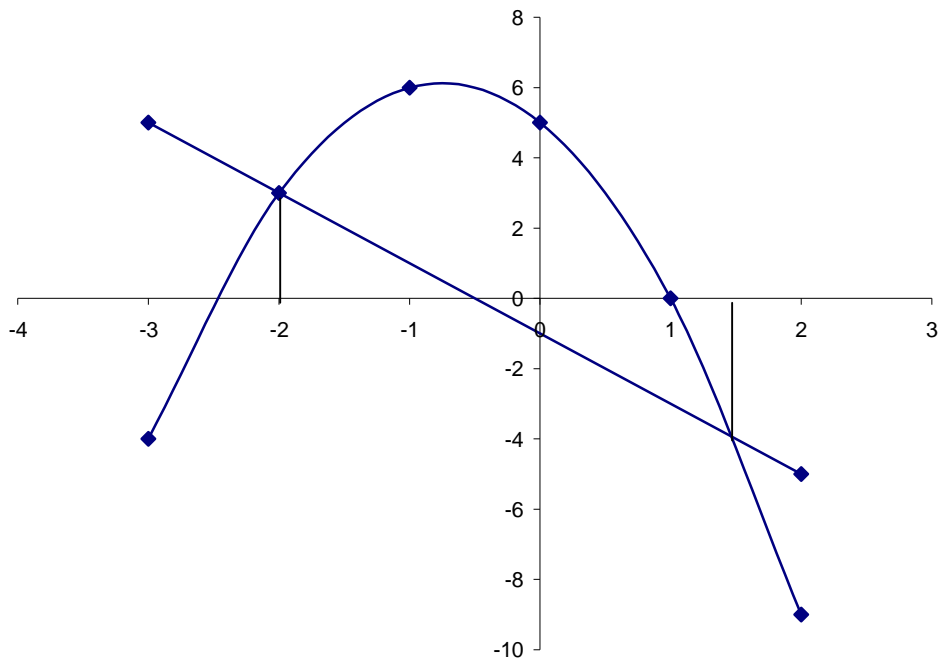
Using the same axis and scales, draw the graph of f and of g , for $-3 \leq x \leq 2$, $x \in \mathbb{R}$.

x	-3	-2	-1	0	1	2
5	5	5	5	5	5	5
$-3x$	9	6	3	0	-3	-6
$-2x^2$	-18	-8	-2	0	-2	-8
y	-4	3	6	5	0	-9

Couples are $(-3,-4)$, $(-2,3)$, $(-1,6)$, $(0,5)$, $(1,0)$ and $(2,-9)$

x	-3	2
$-2x$	6	-4
-1	-1	-1
y	5	-5

Couples are $(-3,5)$ and $(2,-5)$



(c) Use your graph from part (b) to estimate:

(i) the maximum value of $f(x)$

(ii) the values of x for which $f(x) = g(x)$

(iii) the range of values of x for which $f(x) \geq g(x)$.

(i) the maximum value of $f(x)$ is 6.

(ii) $x = -2$ and $x = 1.5$

(iii) $-2 \leq x \leq 1.5$.