1. Sketch graphs for

(a) $y = (x - 1)(x - 3)$

(b) $y = x(x + 2)(x - 3)$

(c) $y = -x(x - 1)(x - 2)$

(d) $y = (x + 2)^2$

(e) $y = (x + 1)^3$

(f) $y = x(x - 3)^2$

(g) $y = (x + 1)^2(x - 1)$

(h) $y = -(x + 2)(x - 1)^3$

(i) $y = (x - 1)^2(x - 3)^2$

(j) $y = x^2(1 - x)(x + 1)$

(k) $y = x^3(1 - x)^3$

(l) $y = 2(1 - x)^4(x + 2)^5$

2. Sketch graphs for

(a) $y = x^3 + 3x^2 + 2x$

(b) $y = x^3 - 6x^2 + 9x$

(c) $y = x^3 + 2x^2 - x - 2$

3. Solve using graphical means:

(a) $(x - 2)(x + 3) < 0$

(b) $(x - 2)(x + 3) > 0$

(c) $x^2 + 5x + 6 \leq 0$

(d) $x^2 + 5x + 6 > 0$

(e) $x(x + 1)(x - 1) \leq 0$

(f) $-x(x + 1)(x - 1) \leq 0$

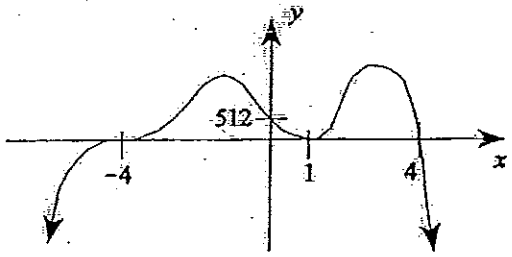
(g) $x^3 - 5x^2 + 4x \geq 0$

(h) $x(x - 2)^2 > 0$

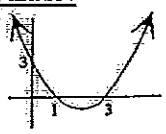
(i) $x(x - 2)^2 \leq 0$

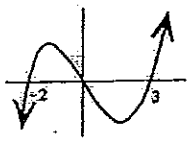
4. Sketch the function $y = f(x)$, where $f(x) = \begin{cases} -x^2(x+2) & x < 0 \\ x - x^3 & x \geq 0 \end{cases}$

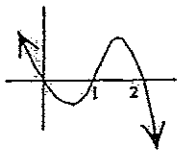
5. Write down the equation of lowest degree for the following polynomial graph:

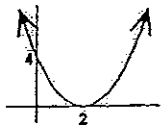


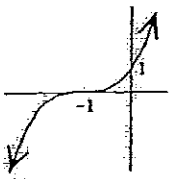
ANSWERS:

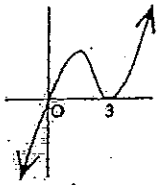
1. (a) 

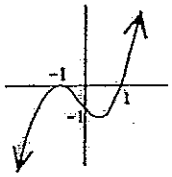
(b) 

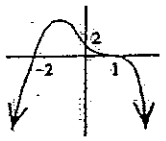
(c) 

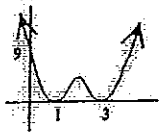
(d) 

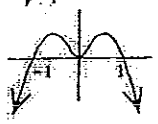
(e) 

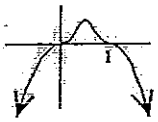
(f) 

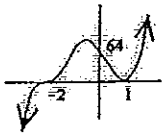
(g) 

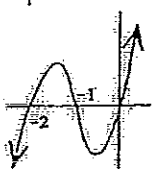
(h) 

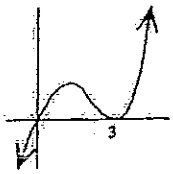
(i) 

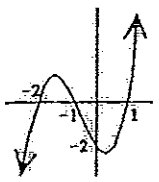
(j) 

(k) 

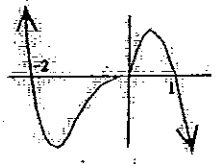
(l) 

2. (a) 

(b) 

(c) 

3. (a) $-3 < x < 2$ (b) $x < -3,\ x > 2$ (c) $-3 \le x \le -2$ (d) $x < -3,\ x > -2$
(e) $x \le -1,\ 0 \le x \le 1$ (f) $-1 \le x \le 0,\ x \ge 1$ (g) $0 \le x \le 1,\ x \ge 4$ (h) $x > 0,\ x \ne 2$
(i) $x \le 0,\ x = 2$

4. 

5. $y = -2(x - 1)^2 (x - 4) (x + 4)^3$