Polynomials – Questions

Q1) a) Show that $(x-3)$ is a factor of $f(x) = x^3 - 8x^2 + 19x - 12$

b) Hence, fully factorise $f(x)$ and solve $f(x) = x^3 - 8x^2 + 19x - 12 = 0$

Q2) a) Show that $(x-1)$ is a factor of $f(x) = 3x^3 + 4x^2 - 5x - 2$

b) Hence, fully factorise $f(x)$ and solve $f(x) = 3x^3 + 4x^2 - 5x - 2 = 0$

Q3) a) Show that $(x+3)$ is a factor of $g(x) = x^3 - 13x - 12$

b) Hence, fully factorise $g(x)$ and solve $g(x) = x^3 - 13x - 12 = 0$

Q4) When $f(x) = x^3 + ax^2 - 3x + 1$ is divided by $(x+1)$ the remainder is 5. Determine the value of a.

Q5) Determine the co-ordinates of the points where the following functions intercept the co-ordinate axes.

a) $f(x) = x^3 - 8x^2 + 19x - 12$

b) $f(x) = 3x^3 + 4x^2 - 5x - 2$

Q6) Given that the function $f(x) = 2x^3 + 3x^2 + ax - 2$ crosses the x −axis at $x = 1$, determine the other points of intersection with the x −axis and the y −intercept.

Q7) Determine the co-ordinates of the points of intersection of the following pairs of functions.

a) $y = 2x - 18$ and $y = x^3 - 10x^2 + 19x + 10$

b) $y = 16 - 8x$ and $y = x^3 + 9x^2 + 3x - 5$

Q8) Sketch the graph of the following cubic functions.

a) $f(x) = (x+3)(x-2)(x-3)$

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

Polynomials – Solutions

Q1) a) Since the remainder is 0, $(x-3)$ is a factor of $f(x)$.

b) $x=1, x=3, x=4$

Q2) a) Since the remainder is 0, $(x-1)$ is a factor of $f(x)$.

b) $x=-2, x=-1, x=1$

Q3) a) Since the remainder is 0, $(x+3)$ is a factor of $g(x)$.

b) $x=-3, x=-1, x=4$

Q4) $a=2$

Q5) a) x-axis: $(1,0), (3,0), (4,0)$

y-axis: $(0,-12)$

b) x-axis: $(-2,0), \left(-\frac{1}{3},0\right), (1,0)$

y-axis: $(0,-2)$

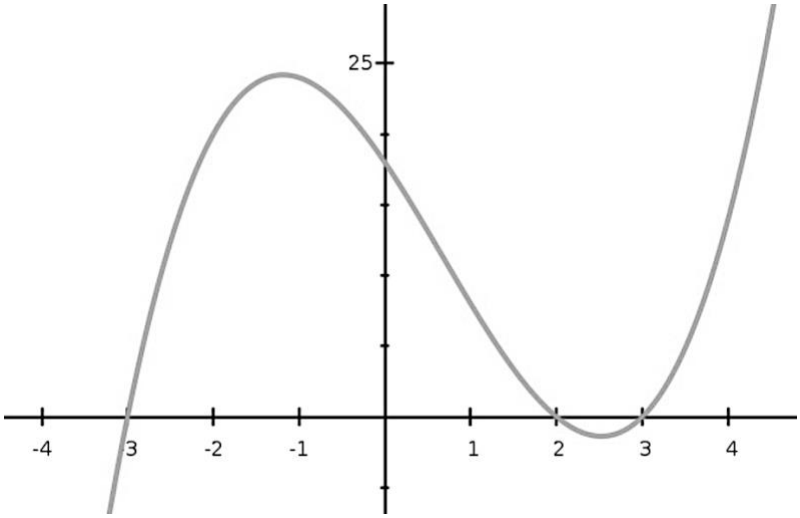
Q6) x-axis: $(-2,0), \left(-\frac{1}{2},0\right), (1,0)$

y-axis: $(0,-2)$

Q7) a) $(-1,-20), (4,-10), (7,-4)$

b) $(-7,72), (-3,40), (1,8)$

Q8) a)



b)