Higher Homework 09

1) Solve,

a) $x^3 - 3x^2 - 10x + 24 = 0$ b) $x^3 - 7x + 6 = 0$

2) Find the value of k for which these equations have real roots,

a) $kx^2 - 12x + 9 = 0$ b) $x^2 + (k + 1)x = -9$

3) $f(x) = 6x^3 - 5x^2 - 17x + 6$.

a) Show that $(x - 2)$ is a factor of $f(x)$.

b) Express $f(x)$ in fully factorised form.

4) Find the value of k if $(x - 4)$ is a factor of $p(x) = 2x^3 - 5x^2 + kx - 20$.

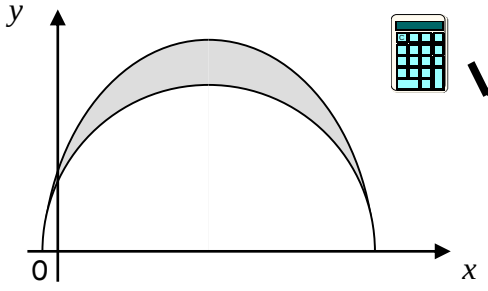
5) Find,

a) $\int (9x^4 + 7x^2 - 2)\ dx$ b) $\int (6x^3 - 7 + \frac{5}{2x^3})\ dx$

c) $\int (6x^2 + \frac{2}{x})^2\ dx$ d) $\int (\frac{7 - 2x}{\sqrt{x}})\ dx$

6) Evaluate, $\int_{12}^{20} x(x + 7)\ dx$

7) Calculate the shaded area enclosed between the parabolas with equations $y = 1 + 10x - 2x^2$ and $y = 1 + 5x - x^2$.



8) The curve $y = f(x)$ is such that $\frac{dy}{dx} = 4x - 6x^2$. The curve passes through (-1, 9).

Express y in terms of x.

9) Two functions f and g are defined by $f(x) = \frac{1}{x - 2}$ and $g(x) = 7x + 5$.

a) Find an expression for $h(x) = f(g(x))$.

b) Write down any restriction of the domain of h.