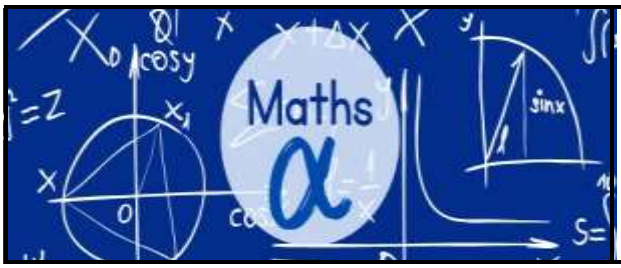

Year 12 / AS

Weekly Tutorial 01

mathsalpha.com

1. Given that $(x+y)(2x-3y)(2x+3y) = ax^3 + by^3 + cx^2y + dy^2x$, Find a, b, c and d constants.

2. Simplify the following.

a) $\left(\frac{625}{256}\right)^{-\frac{3}{4}}$

b) $\frac{3x^3y^4 - 4x^5y^3}{x^3y^3}$

3.

a) Prove that $x^3 - y^3 = (x-y)(x^2+xy+y^2)$

b) Hence prove that $\frac{x^3-y^3}{x^2-y^2} = \frac{x^2+xy+y^2}{x+y}$

4. Rationalize the denominator.

a) $\frac{\sqrt{3}}{(\sqrt{3}-1)^2}$

b) $\frac{\sqrt{20}-2}{\sqrt{45}+1}$

5. Solve; $2 + 3x = \sqrt{3}(2x+1)$

6. Solve by completing the squares, $\sqrt{3}x^2 - \sqrt{27}x - 27 = 0$

7. Sketch the graph of $y = 2x^2 + 3x - 7$ showing roots, coordinates at the turning points and y-intercept.

8. $f(x) = 2x^2 + 3kx + 2$
Find the values of k for which $f(x)$ has equal roots.

9. Find the range of value of a for which $3x^2 + 2x + a = 0$ has two distinct real roots.

10. $f(x) = 2x^2 + (k+3)x + k$.
Prove that $f(x)$ has two distinct real roots for all values of k.

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