Answer to Question #83791 – Math – Algebra

Question

$6x^3 - 48x^2 + x - 8$ Simplify it.

Solution

$$6x^3 - 48x^2 + x - 8 = 0 \text{ .....(1)}$$

Assume $x = 8$, put in equation (1) and get the correct equality

$$6 * 8^3 - 48 * 8^2 + 8 - 8 = 0$$

It means that $x = 8$ is a solution of the equation (1),

dividing the left-hand side of the equation (1) by $x - 8$

$$\frac{6x^3 - 48x^2 + x - 8}{x - 8} = 6x^2 + 1$$

Thus, we can rewrite

$$6x^3 - 48x^2 + x - 8 = (6x^2 + 1)(x - 8) = 0$$

So $(x - 8) = 0$ or $(6x^2 + 1) = 0$

From $(x - 8) = 0$ it follows that $x = 8$

From $(6x^2 + 1) = 0$ it follows that $x^2 = -\frac{1}{6}$, $x = \pm\frac{i}{\sqrt{6}}$.

Answer: $x = 8$, $x = +\frac{i}{\sqrt{6}}$, $x = -\frac{i}{\sqrt{6}}$.