NC EMPT'S QUESTION of the week

Question 12
Nov 10, 2025

12. Find the quotient and remainder when $2x^3 - 3 - 6x$ is divided by $4 + 2x$.

A. Quotient: $x^2 - 5x$; remainder: -31
B. Quotient: $x^2 - 2x + 1$; remainder: 1
C. Quotient: $x^2 - 3x$; remainder: $17x$
D. Quotient: $x^2 - 2x + 1$; remainder: -7
E. Quotient: $x^2 - 5x$; remainder: 25

Last Week's Answer

11. Solve this equation $5 + 3x(x - 2) = 4$.

A. $\frac{3\pm\sqrt{6}}{3}$ B. $\pm\sqrt{24}$ C. $1 \pm 2\sqrt{6}$ D. $\frac{3\pm2\sqrt{3}}{3}$ E. $-1 \pm \frac{1}{3}\sqrt{6}$

Solution:

Use the distributive property to remove the parentheses on the left side of the equation. You will notice that the equation is quadratic. Set the equation equal to 0. Write the terms on the left in descending order. Despite your best efforts it will not factor, so another method is to use the quadratic formula.

$$5 + 3x(x - 2) = 4$$
$$5 + 3x^2 - 6x = 4$$
$$3x^2 - 6x + 1 = 0$$

$Let\ a = 3, b = -6, c = 1.$ $\quad x = \frac{-b\pm\sqrt{b^2-4ac}}{2a}$

$$x = \frac{-(-6) \pm \sqrt{(-6)^2 - 4(3)(1)}}{2(3)}$$

$$x = \frac{6 \pm \sqrt{36 - 12}}{6} = \frac{6 \pm \sqrt{24}}{6} = \frac{6 \pm \sqrt{4 \cdot 6}}{6}$$

$$x = \frac{6 \pm 2\sqrt{6}}{6} = \frac{2(3 \pm \sqrt{6})}{6} = \frac{3 \pm \sqrt{6}}{3}$$

Each week, we'll reveal the answer to the previous week's question!

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