

Dividing Polynomials Bell Work

Answer:

Divide the following polynomials by monomials.

1. $3a^4 + 12a^3 - 18a^2 + 12a$ by $3a$

2. $15x^3 - 10x^2 + 5x$ by $5x$

3. $24b^3 - 12b^2 + 6b - 4$ by 2

4. $25c^3 + 15c^2 - 50c + 10$ by 5

Divide the polynomials by binomials.

5. $27x^3 + 8$ by $3x + 2$

6. $x^4 - 16$ by $x - 2$

7. $6a^2 - 7ab + b^2$ by $2a + b$

8. $12x^3 - 5x^2 - 3x - 5$ by $4x - 3$

Divide the following polynomials using synthetic division.

9. $x^3 - 7x - 4$ by $x + 2$

10. $3x^3 + 11x^2 - 5x$ by $x + 4$

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Answer:

Divide the following polynomials by monomials.

1. $3a^4 + 12a^3 - 18a^2 + 12a$ by $3a$

Solution:

$$\begin{array}{r} 3a^4 + 12a^3 - 18a^2 + 12a \\ \underline{3a} \\ = a^3 + 4a^2 - 6a + 4 \end{array}$$

2. $15x^3 - 10x^2 + 5x$ by $5x$

Solution:

$$\begin{array}{r} 15x^3 - 10x^2 + 5x \\ \underline{5x} \\ = 3x^2 - 10x + 1 \end{array}$$

3. $24b^3 - 12b^2 + 6b - 4$ by 2

Solution:

$$\begin{array}{r} 24b^3 - 12b^2 + 6b - 4 \\ \underline{2} \\ = 12b^3 - 6b^2 + 3b - 2 \end{array}$$

4. $25c^3 + 15c^2 - 50c + 10$ by 5

Solution:

$$\begin{array}{r} 25c^3 + 15c^2 - 50c + 10 \\ \underline{5} \\ = 5c^3 + 3c^2 - 10c + 2 \end{array}$$

Divide the polynomials by binomials.

5. $27x^3 + 8$ by $3x + 2$

Solution:

$$\begin{array}{r} 9x^2 - 6x + 4 \\ 3x + 2 \overline{) 27x^3} \\ \underline{-(27x^3 + 18x^2)} \\ -18x^2 \\ \underline{-(-18x^2 - 12x)} \\ 12x + 8 \\ \underline{-(12x + 8)} \\ 0 \end{array}$$

$$= 9x^2 - 6x + 4$$

6. $x^4 - 16$ by $x - 2$

Solution:

$$\begin{array}{r} x^3 + 2x^2 + 4x + 8 \\ x - 2 \overline{) x^4} \\ \underline{-(x^4 - 2x^3)} \\ 2x^3 \\ \underline{-(2x^3 - 4x^2)} \\ 4x^2 \\ \underline{-(4x^2 - 8x)} \\ 8x - 16 \\ \underline{-(8x - 16)} \\ 0 \end{array}$$

$$= x^3 + 2x^2 + 4x + 8$$

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7. $6a^2 - 7ab + b^2$ by $2a + b$

Solution:

$$\begin{array}{r}
 3a - 5b \\
 2a + b \overline{) 6a^2 - 7ab + b^2} \\
 \underline{-(6a^2 + 3ab)} \\
 -10ab + b^2 \\
 \underline{-(-10ab - 5b^2)} \\
 6b^2
 \end{array}$$

$$= 3a - 5b + \frac{6b^2}{2a + b}$$

8. $12x^3 - 5x^2 - 3x - 5$ by $4x - 3$

Solution:

$$\begin{array}{r}
 3x^2 + x \\
 4x - 3 \overline{) 12x^3 - 5x^2 - 3x - 5} \\
 \underline{-(12x^3 - 9x^2)} \\
 4x^2 - 3x \\
 \underline{-(4x^2 - 3x)} \\
 0 - 5
 \end{array}$$

$$= 3x^2 + x - \frac{5}{4x - 3}$$

Divide the following polynomials using synthetic division.

9. $x^3 - 7x - 4$ by $x + 2$

Solution:

$$\begin{array}{r|rrrr}
 x^3 & x^2 & x & c \\
 1 & 0 & -7 & -4 & \underline{-2} \\
 \downarrow & -2 & 4 & 6 & \\
 1 & -2 & -3 & 2 &
 \end{array}$$

$$= x^2 - 2x - 3 + \frac{2}{x + 2}$$

10. $3x^3 + 11x^2 - 5x$ by $x + 4$

Solution:

$$\begin{array}{r|rrrr}
 x^3 & x^2 & x & c \\
 3 & 11 & -5 & 0 & \underline{-4} \\
 \downarrow & -6 & -10 & 30 & \\
 3 & 5 & -15 & 30 &
 \end{array}$$

$$= 3x^2 + 5x - 15 + \frac{30}{x + 4}$$