

Divide using polynomial long division.

1) $(7p^3 - 45p^2 + 40p + 54) \div (p - 5)$

2) $(10x^3 + x^2 - 17x - 8) \div (x + 1)$

3) $(x^3 - 2x^2) \div (x - 2)$

4) $(a^4 + 2a^3 - 67a^2 + 25a + 31) \div (a - 7)$

Divide using synthetic division.

5) $(x^3 - 8x^2 + 7x + 39) \div (x - 4)$

6) $(12x^4 + 27x^3 + 18x^2 + 33x + 23) \div (x + 2)$

7) $(11b^3 - 120b^2 - 133b - 132) \div (b - 12)$

8) $(11n^3 + 6n^2 - 15n - 10) \div (n + 1)$

Given a polynomial $f(x)$ and a factor of $f(x)$, factor $f(x)$ completely.

9) $f(x) = 9x^3 + 36x^2 + 17x - 30$; $3x - 2$

10) $f(x) = 6x^3 + 7x^2 - 23x - 30$; $3x + 5$

11) $f(x) = 15x^3 - 73x^2 - 18x + 40$; $3x - 2$

12) $f(x) = 3x^3 - 7x^2 - 7x + 3$; $x - 3$

Answers:

- 1) $7p^2 - 10p - 10 + \frac{4}{p-5}$ 2) $10x^2 - 9x - 8$ 3) x^2
 4) $a^3 + 9a^2 - 4a - 3 + \frac{10}{a-7}$ 5) $x^2 - 4x - 9 + \frac{3}{x-4}$ 6) $12x^3 + 3x^2 + 12x + 9 + \frac{5}{x+2}$
 7) $11b^2 + 12b + 11$ 8) $11n^2 - 5n - 10$ 9) Factors to: $f(x) = (3x+5)(x+3)(3x-2)$
 Zeros: $\left\{-\frac{5}{3}, -3, \frac{2}{3}\right\}$
 10) Factors to: $f(x) = (2x+3)(x-2)(3x+5)$ 11) Factors to: $f(x) = (5x+4)(x-5)(3x-2)$
 Zeros: $\left\{-\frac{3}{2}, 2, -\frac{5}{3}\right\}$ Zeros: $\left\{-\frac{4}{5}, 5, \frac{2}{3}\right\}$
 12) Factors to: $f(x) = (x+1)(3x-1)(x-3)$
 Zeros: $\left\{-1, \frac{1}{3}, 3\right\}$