

Polynomial Division

Date _____ Period _____

Divide Using Long Division

1) $(5x^2 - 32x + 4) \div (x - 6)$

2) $(9x^3 + 13x^2 - 23x - 12) \div (9x + 4)$

3) $(6n^2 + 30n - 39) \div (6n - 6)$

4) $(p^4 - 13p^3 + 52p^2 - 66p - 28) \div (p - 7)$

5) $(5a^4 - 20a^2 - 45a + 91) \div (5a - 10)$

6) $(p^3 + 8p^2 + 81) \div (p + 9)$

Divide Using Synthetic Division

7) $(4n^2 - 45n + 47) \div (n - 10)$

8) $(3x^2 - 25x + 42) \div (x - 6)$

9) $(n^3 + 5n^2 - 3n - 18) \div (n + 2)$

10) $(k^3 + 4k^2 - 3k + 15) \div (k + 5)$

11) $(5p^2 - 48p - 12) \div (p - 10)$

12) $(9n^4 + 81n^3 + n + 8) \div (n + 9)$

13) $(9x^3 - 44x^2 + 29x + 4) \div (x - 4)$

14) $(4r^5 - r^4 - 2r^3 + 7r^2 - 3r - 7) \div (r + 1)$

Factor each and find all zeros. One zero has been given.

15) $f(x) = 15x^4 - 2x^3 + 59x^2 - 8x - 4; -\frac{1}{5}$

16) $f(x) = 4x^4 - 8x^3 - 65x^2 + 10x + 75; -3$

17) $f(x) = 2x^5 + 6x^4 + 3x^3 + 9x^2 - 35x - 105; -3$

18) $f(x) = 3x^5 + 6x^4 + 20x^3 + 40x^2 - 32x - 64; -2$

Answers to Polynomial Division (ID: 1)

$$1) 5x - 2 - \frac{8}{x-6}$$

$$3) n + 6 - \frac{1}{2n-2}$$

$$5) a^3 + 2a^2 - 9 + \frac{1}{5a-10}$$

$$7) 4n - 5 - \frac{3}{n-10}$$

$$9) n^2 + 3n - 9$$

$$11) 5p + 2 + \frac{8}{p-10}$$

$$13) 9x^2 - 8x - 3 - \frac{8}{x-4}$$

$$15) \text{ Factors to: } f(x) = (3x-1)(x^2+4)(5x+1)$$

$$\text{Zeros: } \left\{ \frac{1}{3}, 2i, -2i, -\frac{1}{5} \right\}$$

$$17) \text{ Factors to: } f(x) = (2x^2-7)(x^2+5)(x+3)$$

$$\text{Zeros: } \left\{ \frac{\sqrt{14}}{2}, -\frac{\sqrt{14}}{2}, i\sqrt{5}, -i\sqrt{5}, -3 \right\}$$