

**Assignment**

Date \_\_\_\_\_ Period \_\_\_\_\_

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**Simplify each expression.**

1)  $(6a + 7a^4) + (a + 5)$

2)  $(4 - 5r) - (3 - r - 7r^4)$

3)  $(8n^4 + 7n + 2n^3) + (5 - 3n + 7n^4)$

$$4) (5 - 4x^3 - 5x + 8x^4) - (4 + 6x^3 + 5x) + (6x + 3x^4 - 5)$$

**Find each product.**

$$5) 2(8b - 6)$$

$$6) 4(6v - 2)$$

$$7) (4a + 5)(3a - 4)$$

$$8) (6k + 2)(8k + 5)$$

9)  $(3m + 3)(7m^2 - 5m + 7)$

10)  $(5n^2 - 7n - 5)(7n^2 - 5n + 6)$

**Name each polynomial by degree and number of terms.**

11) 10

12)  $4x^4$

**Divide.**

13)  $(x^4 - 17x^3 + 65x^2 + 28x + 49) \div (x - 7)$

14)  $(v^4 - 5v^3 - 39v^2 - 11v + 4) \div (v + 4)$

$$15) (n^4 + 3n^3 - 3n - 10) \div (n + 3)$$

$$16) (a^4 + 6a^3 - 13a^2 + 32a + 65) \div (a + 8)$$

**Evaluate each function at the given value.**

$$17) f(x) = 6x^4 + 14x^3 + 10x^2 + 15x - 2 \text{ at } x = -2$$

$$18) f(x) = -6x^3 - 32x^2 - 4x + 23 \text{ at } x = -5$$

$$19) f(m) = m^3 - 4m^2 - 5m + 26 \text{ at } m = 4$$

20)  $f(x) = x^4 - 3x^3 - 3x^2 - 9x + 13$  at  $x = 4$

**Factor each.**

21)  $x^4 + 8x^2 + 7 = 0$

22)  $x^3 + 8 = 0$

23)  $x^4 + 5x^2 - 36 = 0$

24)  $x^3 - 4x^2 - 3x + 12 = 0$

**State the number of complex roots for each equation. Then find all rational roots.**

25)  $x(3x + 2)(x - 4) = 0$

26)  $x(5x - 4)(x - 1) = 0$

27)  $(3x - 4)(x + 2) = 0$

28)  $(x - 4)(x^2 + 4x + 16) = 0$

## Answers to Assignment (ID: 1)

- 1)  $7a^4 + 7a + 5$       2)  $7r^4 - 4r + 1$       3)  $15n^4 + 2n^3 + 4n + 5$   
 4)  $11x^4 - 10x^3 - 4x - 4$       5)  $16b - 12$       6)  $24v - 8$   
 7)  $12a^2 - a - 20$       8)  $48k^2 + 46k + 10$       9)  $21m^3 + 6m^2 + 6m + 21$   
 10)  $35n^4 - 74n^3 + 30n^2 - 17n - 30$       11) constant monomial      12) quartic monomial  
 13)  $x^3 - 10x^2 - 5x - 7$       14)  $v^3 - 9v^2 - 3v + 1$       15)  $n^3 - 3 - \frac{1}{n+3}$   
 16)  $a^3 - 2a^2 + 3a + 8 + \frac{1}{a+8}$       17)  $-8$       18)  $-7$   
 19)  $6$       20)  $-7$       21)  $(x^2 + 1)(x^2 + 7) = 0$   
 22)  $(x + 2)(x^2 - 2x + 4) = 0$       23)  $(x - 2)(x + 2)(x^2 + 9) = 0$       24)  $(x - 4)(x^2 - 3) = 0$   
 25) # of complex roots: 3      26) # of complex roots: 3      27) # of complex roots: 2  
     Rational roots:  $\left\{0, -\frac{2}{3}, 4\right\}$       Rational roots:  $\left\{0, \frac{4}{5}, 1\right\}$       Rational roots:  $\left\{\frac{4}{3}, -2\right\}$   
 28) # of complex roots: 3  
     Rational roots:  $\{4\}$