

Chapter 6 (6.1 to 6.3) Practice Test

DEGREE = HIGHEST EXPONENT

Date _____ Period _____

Name each polynomial by degree and number of terms.

1) $9a^3$ D: CUBIC
T: MONOMIAL

2) $8 + 8r - 8r^2$ D: QUADRATIC
T: TRINOMIAL

3) $4 - 10v$ D: LINEAR
T: BINOMIAL

4) $4k^3 + 4k^2$ D: CUBIC
T: BINOMIAL

5) 5 D: CONSTANT
T: MONOMIAL
 $5x^0 = 5 \cdot 1 = 5$

6) $-3m^2 + 5m - 3$ D: QUADRATIC
T: TRINOMIAL

7) $6n$ D: LINEAR
T: MONOMIAL

8) $4n - 7n^2 + 3 - 4n^3$ D: CUBIC
T: WITH 4 TERMS

NAMES

BY TERMS

1 - MONOMIAL

2 - BINOMIAL

3 - TRINOMIAL

4+ WITH "N" TERMS

BY DEGREE

0 - Constant

1 - Linear

2 - Quadratic

3 - Cubic

4 - Quartic

Simplify each sum. Combine Like Terms

9) $(-7x^4 - 5x + 6x^2) + (5x + 6x^4 - 7x^2)$
 $-x^4 - x^2$

10) $(-5x^4 + 5x^2 + 6) + (-5x^3 - 4x^2 - 8)$
 $-5x^4 - 5x^3 + x^2 - 2$

11) $(-4x + 8x^2 + 1) + (-1 + 5x + 3x^2)$
 $11x^2 + x$

12) $(-4x^4 + 7 + x^2) + (-4 + 4x^4 - 8x^2)$
 $-7x^2 + 3$

Simplify each difference. WRITE AS AN ADDITION PROBLEM.

13) $(-8x^3 + 5x + 8x^4) - (-7x^4 + x^2 - 8x^3)$
 $-8x^3 + 5x + 8x^4 + 7x^4 - x^2 + 8x^3$
 $15x^4 - x^2 + 5x$

14) $(3x^2 - x + 8) - (6 + x^2 + 8x)$
 $3x^2 - x + 8 - 6 - x^2 - 8x$
 $2x^2 - 9x + 2$

15) $(-3x^3 + 3x^4 - 5) - (1 - 3x^3 + 8x^4)$
 $-3x^3 + 3x^4 - 5 - 1 + 3x^3 - 8x^4$
 $-5x^4 - 6$

16) $(-5 - 7x^2 + 7x^4) - (-2x^2 - 8 - 4x^4)$
 $-5 - 7x^2 + 7x^4 + 2x^2 + 8 + 4x^4$
 $11x^4 - 5x^2 + 3$

Write in simplified exponential form then evaluate.

17) $2^1 \cdot 2^3 = 2^{1+3} = 2^4 = 16$
 EXPONENTIAL FORM \rightarrow 2, 4

18) $3^1 \cdot 3^2 = 3^{1+2} = 3^3 = 27$

19) $\frac{(-4)^2}{(-4)^1} = (-4)^{2-1} = -4$

20) $\frac{4^4}{4^1} = 4^{4-1} = 4^3 = 64$

Simplify.

21) $3x^2 \cdot -2x^0 \cdot -4x^3 = 3 \cdot -2 \cdot -4 \cdot x^{2+0+3} = 24x^5$
 ← mental step

22) $-2x^0 \cdot x^2 \cdot 3x^4 = -2 \cdot 1 \cdot 3 \cdot x^{0+2+4} = -6x^6$

23) $-3x^3 \cdot 4yx^2 \cdot -y^3 = -3 \cdot 4 \cdot -1 \cdot x^{3+2} \cdot y^{1+3} = 12x^5y^4$

24) $-4xy^4 \cdot 2x^4y^2 = -4 \cdot 2 \cdot x^{1+4} \cdot y^{4+2} = -8x^5y^6$

Simplify. Your answer should contain only positive exponents.

25) $-\frac{x^3}{4x} = \frac{-1x^3}{4x^1} = \frac{-1x^{3-1}}{4} = \frac{-x^2}{4}$
 Simplify the fraction

26) $\frac{2x}{-x} = \frac{2x}{-1x} = -2$

Simplify.

27) $(-3n^2)^3 = (-3)^3 \cdot n^{2 \cdot 3} = -27n^6$
 ← ODD EXP = -N
 Power to power MULT EXP

28) $(-4y^4)^4 = (-4)^4 \cdot y^{4 \cdot 4} = 256y^4$
 ← DISTRIBUTE (4) and MULT EXP
 EVEN EXP = +N

Simplify. LEAVE YOUR ANSWER AS AN IMPROPER FRACTION.

29) $\left(-\frac{3x}{2y^2}\right)^4 = \frac{(-3x)^4}{(2y^2)^4} = \frac{81x^4}{16y^8}$
 ← DISTRIBUTE 4

30) $\left(\frac{2x^2}{-5y}\right)^3 = \frac{2^3x^6}{(-5)^3y^3} = \frac{8x^6}{-125y^3}$
 ← MULT EXP

Find each product.

31) $5n(8n^2 + 7n - 8)$

$$40n^3 + 35n^2 - 40n$$

32) $-6x^3(8x^2 - 4x - 2)$

$$-48x^5 + 24x^4 + 12x^3$$

33) $(2x + 5)(2x - 8)$

$$4x^2 - 16x + 10x - 40$$

simplify

$$4x^2 - 6x - 40$$

34) $(2b - 5)(4b - 8)$

$$8b^2 - 16b - 20b + 40 =$$

$$8b^2 - 36b + 40$$

35) $(4k + 5)(4k - 5)$

$$16k^2 - 20k + 20k - 25 = 0$$

$$16k^2 - 25$$

36) $(2b + 8)(2b - 8)$

$$4b^2 - 16b + 16b - 64 =$$

$$4b^2 - 64$$

37) $(5x - 2)^2 \rightarrow$ EXPAND

$$(5x - 2)(5x - 2)$$

$$25x^2 - 10x - 10x + 4$$

$$25x^2 - 20x + 4$$

38) $(4n - 2)^2 \rightarrow$ EXPAND

$$(4n - 2)(4n - 2)$$

$$16n^2 - 8n - 8n + 4$$

$$16n^2 - 16n + 4$$

39) $(r - 2)(2r^2 - 4r + 4)$

$$2r^3 - 4r^2 + 4r - 4r^2 + 8r - 8 =$$

$$2r^3 - 8r^2 + 12r - 8$$

40) $(5x + 4)(4x^2 - 8x + 6)$

$$20x^3 - 40x^2 + 30x + 16x^2 - 32x + 24 =$$

$$20x^3 - 24x^2 - 2x + 24$$

Multiply. Expand completely.

41) $(x + 4)^3 \rightarrow$ EXPAND

$$(x + 4)(x + 4)(x + 4)$$

$$(x + 4)(x^2 + 4x + 4x + 16)$$

$$(x + 4)(x^2 + 8x + 16)$$

$$x^3 + 8x^2 + 16x + 4x^2 + 32x + 64 =$$

$$x^3 + 12x^2 + 48x + 64$$

42) $(x - 5)^3 \rightarrow$ EXPAND

$$(x - 5)(x - 5)(x - 5) =$$

$$(x - 5)(x^2 - 10x + 25) =$$

$$x^3 - 10x^2 + 25x$$

$$- 5x^2 + 50x - 125 =$$

$$x^3 - 15x^2 + 75x - 125$$

Evaluate each function at the given value. Show synthetic substitution or simple substitution.

43) $f(x) = x^3 + 3x^2 - 5x + 19$ at $x = -5$

Synthetic Sub

$$\begin{array}{r|rrrr} -5 & 1 & 3 & -5 & 19 \\ & \downarrow & \downarrow & \downarrow & \downarrow \\ & 1 & -2 & 5 & -6 \end{array}$$

Regular substitution

$$f(-5) = (-5)^3 + 3(-5)^2$$

$$f(-5) = -6$$

44) $f(n) = 2n^4 + 6n^3 - 14n^2 + 27n - 18$ at $n = -5$

$$\begin{array}{r|rrrrr} -5 & 2 & 6 & -14 & 27 & -18 \\ & \downarrow & \downarrow & \downarrow & \downarrow & \downarrow \\ & 2 & -4 & 6 & -3 & -3 \end{array}$$

$$f(-5) = -3$$

45) $f(m) = m^5 - m^4 - 12m^3 - 13m^2 - 7m - 20$ at $m = -2$

$$\begin{array}{r|rrrrrr} -2 & 1 & -1 & -12 & -13 & -7 & -20 \\ & \downarrow & \downarrow & \downarrow & \downarrow & \downarrow & \downarrow \\ & 1 & -3 & -6 & -1 & -5 & -10 \end{array}$$

$$f(-2) = -10$$

46) $f(x) = x^5 - 5x^4 + 10x^3 - 30x^2 + 27x - 16$ at $x = 4$

$$\begin{array}{r|rrrrrr} 4 & 1 & -5 & 10 & -30 & 27 & -16 \\ & \downarrow & \downarrow & \downarrow & \downarrow & \downarrow & \downarrow \\ & 1 & -1 & 6 & -6 & 3 & -4 \end{array}$$

$$f(4) = -4$$

47) $f(n) = n^6 - 2n^5 - 8n^4 - 4n^3 - 8n^2 - 9$ at $n = -2$

$$\begin{array}{r|rrrrrr} -2 & 1 & -2 & -8 & -4 & -8 & -9 \\ & \downarrow & \downarrow & \downarrow & \downarrow & \downarrow & \downarrow \\ & 1 & -4 & 0 & -4 & 0 & -9 \end{array}$$

$$f(-2) = -9$$

48) $f(x) = -4x^6 + 22x^5 + 7x^4 + 30x^3 - 2x^2 + 11x + 5$ at $x = 6$

Simple substitution

$$f(6) = -4(6)^6 + 22(6)^5 + 7(6)^4 + 30(6)^3 - 2(6)^2 + 11(6) + 5$$

Synthetic substitution

$$\begin{array}{r|rrrrrrr} 6 & -4 & 22 & 7 & 30 & -2 & 11 & 5 \\ & \downarrow & \downarrow & \downarrow & \downarrow & \downarrow & \downarrow & \downarrow \\ & -4 & -2 & -5 & 0 & -2 & -1 & -1 \end{array}$$

$$f(6) = -1$$