

Algebra II \ Trig Ch. 7: 7.1-7.3 Quiz

Determine whether each expression is a polynomial. If so, classify the polynomial by degree and terms.

1. $12x^3 - 2x^2 + 2$

yes

Cubic Trinomial

2. $4x - 2^{2x} + 3^{5x}$

No

3. $.66x^4 - 1$

yes

quartic Binomial

4. $10x^3 - 2x^7 + 15$

yes

degree of 7

Trinomial

Evaluate each polynomial for the indicated value of x

5. $x^3 - 3x^2 + 4x$ for $x = -2$

$$\begin{aligned} & (-2)^3 - 3(-2)^2 + 4(-2) \\ & -8 - 12 - 8 \\ & \boxed{-28} \end{aligned}$$

$$\begin{array}{r} -2 \overline{) 1 \ -3 \ 4 \ 0} \\ \underline{-2 \ 10 \ -28} \\ 1 \ -5 \ 14 \ \underline{-28} \end{array}$$

$\boxed{-28}$

6. $4 - 2x + 3x^2 - x^4$ for $x = -1$

$$\begin{aligned} & 4 - 2(-1) + 3(-1)^2 - (-1)^4 \\ & 4 + 2 + 3 - 1 \\ & \boxed{8} \end{aligned}$$

$$\begin{array}{r} -1 \overline{) -1 \ 0 \ 3 \ -2 \ 4} \\ \underline{1 \ -1 \ -2 \ 4} \\ -1 \ 1 \ 2 \ -4 \ \underline{8} \end{array}$$

$\boxed{8}$

Write each sum or difference as a polynomial expression

7. $(-2x^3 + 5x^2 - 3x + 7) + (5x^3 + x^2 + 9)$

$$3x^3 + 6x^2 - 3x + 16$$

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

$$7x^4 - 3x^3 + 5x - 2x^4 - x^3 - x^2 - 3x + 2$$

$$5x^4 - 4x^3 - x^2 + 2x + 2$$

Graph each function. Approximate any local maxima or minima to the nearest tenth. Find the intervals over which the function is increasing and decreasing.

9. $P(x) = x^3 + x^2$

local Max - $(-.7, .1)$

local Min - $(0, 0)$

increasing - $-\infty < x < -.7$
 $0 < x < \infty$

decreasing - $-.7 < x < 0$

10. $P(x) = x^4 - 2x^2 + 2$

local Max - $(0, 2)$

local Min - $(-1, 1)$
 $(1, 1)$

increasing - $-1 < x < 0$
 $1 < x < \infty$

decreasing - $-\infty < x < -1$
 $0 < x < 1$

$$11) (2x-1)^3$$

$$(2x-1)(2x-1)(2x-1)$$

$$(4x^2 - 2x - 2x + 1)(2x-1)$$

$$(4x^2 - 4x + 1)(2x-1)$$

$$8x^3 - 4x^2 - 8x^2 + 4x + 2x - 1$$

$$8x^3 - 12x^2 + 6x - 1$$

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

$$2x^3 - 3x^2 + 4x + 14x^2 - 21x + 28$$

$$2x^3 + 11x^2 - 17x + 28$$

$$13) 2x^3 + 7x^2 - 15x; x+5$$

$$\begin{array}{r} -5 \overline{) 2 \quad 7 \quad -15 \quad 0} \\ \underline{-10 \quad 15 \quad 0} \\ 2 \quad -3 \quad 0 \quad \underline{0} \end{array}$$

yes

14) $2x^3 + 15x^2 - 9x - 10; x + 8$

$$\begin{array}{r} -8 \overline{) 2 \quad 15 \quad -9 \quad -10} \\ \underline{-16 \quad 8 \quad 8} \\ 2 \quad -1 \quad -1 \quad \underline{-2} \end{array}$$

NO

16)

$$\begin{array}{r} \overline{) X^3 + 0x^2 - 43x + 42} \\ \underline{-(X^3 + 6x^2 - 7x)} \\ - 6x^2 - 36x + 42 \\ \underline{-(-6x^2 - 36x + 42)} \\ 0 \end{array}$$

$x-6$

$$17) (x^2 + 9x - 36) \div (x - 3)$$

$$\begin{array}{r|rrr} 3 & 1 & 9 & -36 \\ & & 3 & 36 \\ \hline & 1 & 12 & \underline{0} \end{array}$$

$$\boxed{x + 12}$$

$$18) (x^3 + 8) \div (x - 4)$$

$$\begin{array}{r} 4 \overline{) 1 \ 0 \ 0 \ 8} \\ \underline{ 4 \ 16 \ 64} \\ 1 \ 4 \ 16 \ \underline{72} \end{array}$$

$$x^2 + 4x + 16 + \frac{72}{x-4}$$