

1. Write the following polynomial in standard form $6x^3 + 5x^7 - 2x^9 + 4x^2 + 5$:

$$\boxed{-2x^9 + 5x^7 + 6x^3 + 4x^2 + 5}$$

2. What kind of polynomial is $x^2 + 3x + 2$? (circle all that apply)

Degree: 1

a) linear

b) cubic

c) quadratic

d) constant

e) monomial

f) Binomial

g) trinomial

e) polynomial

Terms: 1

2

3

Any #

← what degree?

← how many terms?

Complete the polynomial operation. (Lesson 6.1, 6.2, 6.3, 6.5)

1. $(8x^3 - 2x^2 - 4x + 8) + (5x^2 + 6x - 4)$

$$\boxed{8x^3 + 3x^2 + 2x + 4}$$

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

$$(5x^2 + 10x)(3x - 7)$$

$$15x^3 - 35x^2 + 30x^2 - 70x$$

$$\boxed{15x^3 - 5x^2 - 70x}$$

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

$$\boxed{-5x^2 - 10x + 13}$$

4. $(3x^3 + 12x^2 + 11x - 2) \div (x + 2)$

$$\begin{array}{r} -2 \overline{) 3 \quad 12 \quad 11 \quad -2} \\ + \downarrow \quad -6 \quad -12 \quad 2 \\ \hline 3 \quad 6 \quad -1 \quad 10 \end{array}$$

$$\boxed{3x^2 + 6x - 1}$$

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

$$\begin{array}{r} 12x^4 + 8x^3 - 4x^2 \\ + 9x^3 + 6x^2 - 3x \\ + 6x^2 + 4x - 2 \\ \hline \end{array}$$

$$\boxed{12x^4 + 17x^3 + 8x^2 + x - 2}$$

5. $(16 - x^4) + (-18x^2 + 7x^5 - 10x^3 + 5)$

$$\boxed{7x^5 - 10x^3 - 18x^2 + 21}$$

6. $(3x^3 - 2x^2 - 7x + 6) \div (x + 1)$

$$\boxed{3x^2 - 5x - 2 \quad R: 8}$$

$$\begin{array}{r} x+1 \overline{) 3x^3 - 2x^2 - 7x + 6} \\ -3x^3 \quad + 3x^2 \quad \downarrow \\ \hline -5x^2 - 7x \quad \downarrow \\ +5x^2 + 5x \quad \downarrow \\ \hline -2x + 6 \quad \downarrow \\ +2x + 2 \\ \hline 8 \end{array}$$

7. $(57x^{18} - x^2) - (6x + 71x^3 + 5x^2 + 2)$

$$\boxed{57x^{18} + 71x^3 - 6x^2 - 6x - 2}$$

Factor the polynomial. (Lesson 6.4)

11. $3x^2 + 4x - 4$ $\frac{6}{6} \times \frac{-2}{-2} = -12$
 $\frac{6}{6} + \frac{-2}{-2} = 4$
 $(3x^2 + 6x - 2x - 4)$
 $3x(x+2) - 2(x+2)$

$(x+2)(3x-2)$

13. $6x(x-2) + 5(x-2)$

$(x-2)(6x+5)$

15. $(36x^2 + 6x) + (6x + 1)$

$(6x+1)(6x+1) + 1(6x+1)$

$(6x+1)(6x+1) = (6x+1)^2$

$3 \cdot m \cdot m \cdot m \cdot m \cdot n - 3 \cdot 4 \cdot m \cdot m \cdot m \cdot n$

12. $3m^5n^2 - 12m^3n$

$3m^3n(m^2n - 4)$

14. $4x^2 - 16x + 16$

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

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

16. $(7x^2 - 3x) + (4x - 6)$

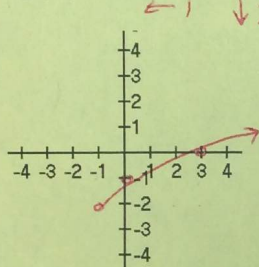
$x(7x-3) + 2(7x-3)$

$(7x-3)(x+2)$

Review

Graph the following functions **without** using a calculator. Next, identify the parent function, list the transformations involved, and also include the new domain and range.

17. $g(x) = \sqrt{x+1} - 2$



Parent Function: \sqrt{x}

Domain: $[-1, \infty)$

Range: $[-2, \infty)$

x-int: $(3, 0)$

y-int: $(0, -2)$

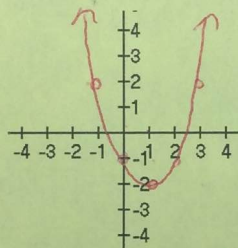
Left EB: None

Right EB: $f(x) = \infty$ as $x \rightarrow \infty$

Inc: $(-1, \infty)$

Dec: Never

18. $h(x) = (x-1)^2 - 2$



Parent Function: x^2

Domain: $(-\infty, \infty)$

Range: $[-2, \infty)$

x-int: $(1 \pm \sqrt{2}, 0)$

y-int: $(0, -2)$

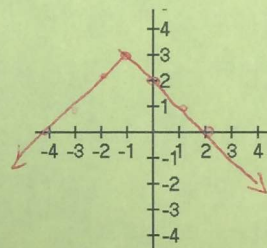
Left EB: $f(x) = \infty$ as $x \rightarrow -\infty$

Right EB: $f(x) = \infty$ as $x \rightarrow \infty$

Inc: $(1, \infty)$

Dec: $(-\infty, 1)$

19. $i(x) = -|x+1| + 3$



Parent Function: $|x|$

Domain: $(-\infty, \infty)$

Range: $(-\infty, 3]$

x-int: $(-4, 0), (2, 0)$

y-int: $(0, 3)$

Left EB: $f(x) = -\infty$ as $x \rightarrow -\infty$

Right EB: $f(x) = -\infty$ as $x \rightarrow \infty$

Inc: $(-\infty, -1)$

Dec: $(-1, \infty)$

$0 = (x-1)^2 - 2 \quad 1 \pm \sqrt{2} = x$
 $2 = (x-1)^2$
 $\pm \sqrt{2} = x-1$