Secondary Math III
Unit 2 Review

Name _____
Period _____

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

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

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

a) linear ← degree 1 b) cubic ← degree 3 c) quadratic ← degree 4 d) constant ← degree 0

e) monomial 1 term f) Binomial 2 terms g) trinomial ↑ 3 terms e) polynomial ↑ any # of terms

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

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

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

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

$5x(x+2)$
$(5x^2 + 10x)(3x - 7)$
$15x^3 - 35x^2 + 30x^2 - 70x$
$\boxed{15x^3 - 5x^2 - 70x}$

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

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

6. $(3x^3 + 12x^2 + 11x - 2) \div (x + 2)$

-2	3	12	11	-2
+	↓	-6	-12	2
	$\boxed{3x^2 + 6x - 1}$			$\boxed{0}$

7. $(x + y)^6$

8. $(5x + y)^4$

9. $(4x^2 + 3x + 2)(3x^2 + 2x - 1)$

$12x^4 + 8x^3 - 4x^2$
$+ 9x^3 + 6x^2 - 3x$
$+ 6x^2 + 4x - 2$

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

10. $(57x^{18} - x^2) + (6x - 71x^3 + 5x^2 - 2)$

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

11. $(9x^4 + x^3 + 11x^2 - 4) \div (x^2 + 16)$

$\boxed{9x^2 + x - 133 \quad R: -16x + 2124}$

$x^2 + 0x + 16 \,\big|\, 9x^4 + 1x^3 + 11x^2 + 0x - 4$
$-9x^4 - 0x^3 - 144x^2$
$x^3 - 133x^2 + 0x$
$x^3 \quad 0x^2 + 16x$
$-133x^2 - 16x - 4$

$-133x^2 - 16x - 4$
$+133x^2 \quad 0x + 2128$
$-16x + 2124$

12. $(16 - x^2) + (-18x^2 + 7x^5 - 10x^4 + 5)$

$\boxed{7x^5 - 10x^4 - 19x^2 + 21}$

Factor the polynomial. *(Lesson 6.4)*

13. $3x^2 + 4x - 4$

6 · -2 = -12

6 + -2 = 4

$(3x^2 + 6x) - (2x - 4)$

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

$\boxed{(x+2)(3x-2)}$

14. $2x^3 + 4x^2 - 30x$

$2x(x^2 + 2x - 15)$

$\boxed{2x(x+5)(x-3)}$

15. $9x^2 - 25$

$a = 3x \quad b = 5 \qquad a^2 - b^2 = (a-b)(a+b)$

$\boxed{(3x-5)(3x+5)}$

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

$\cancel{4(x^2 - 16x}$ $\quad 4(x^2 - 4x + 4)$

$\boxed{4(x-2)(x-2)}$

or $\boxed{4(x-2)^2}$

17. $(x^3 + 8x^2) + (6x + 48)$

$x^2(x+8) + 6(x+8)$

$\boxed{(x+8)(x^2+6)}$

18. $(8x^4 + 8x^3) + (27x + 27)$

$8x^3(x+1) + 27(x+1)$

$a^3 + b^3 = (a+b)(a^2 - ab + b^2)$

$(x+1)(8x^3 + 27)$

$\boxed{(x+1)(2x+3)(4x^2 - 6x + 9)}$

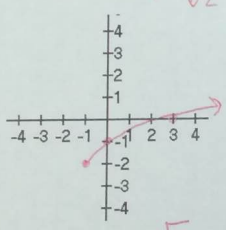
Review

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.

19. $g(x) = \sqrt{x+1} - 2$ ← 1 ↓2

20. $h(x) = 2(x+1)^2 - 2$ ↓ stretch by 2 ← 1 ↓2

21. $i(x) = -3|x+1| + 3$ ↓ flip ↓ stretch by 3 ← 1 ↑3



Parent Function: $\sqrt{x}$

Domain: $[-1, \infty)$

Range: $[-2, \infty)$

x-int: $(3, 0)$

y-int: $(0, -1)$

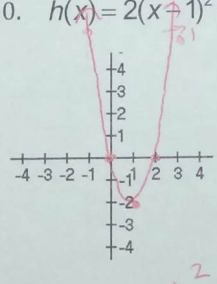
Left EB: None

Right EB: $\lim_{x \to \infty} f(x) = \infty$

x-values

Inc: $(-1, \infty)$

Dec: Never



Parent Function: x^2

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

Range: $[-2, \infty)$

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

y-int: $(0, 0)$

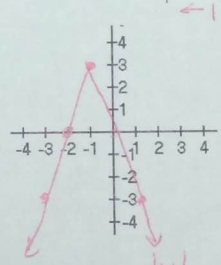
Left EB: $\lim_{x \to -\infty} f(x) = +\infty$

Right EB: $\lim_{x \to +\infty} f(x) = +\infty$

x-values

Inc: $(1, \infty)$

Dec: $(-\infty, 1)$



Parent Function: $|x|$

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

Range: $(-\infty, 3]$

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

y-int: $(0, 0)$

Left EB: $\lim_{x \to -\infty} f(x) = -\infty$

Right EB: $\lim_{x \to +\infty} f(x) = -\infty$

x-values

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

Dec: $(-1, \infty)$