

Math 3 Unit Two Review
Show All Your Work!!!

Write each polynomial function in standard form. Then classify it by degree and by number of terms.

1. $2x + 4 - 2x$
 4
 D: 0
 T: 1

2. $-x^2 + 3x + 2x^2 - 5$
 $x^2 + 3x - 5$
 D: 2
 T: 3

Find the y-intercept of each polynomial function.

3. $y = -2x^2 - x - 7$
 $y = -2(0)^2 - 0 - 7$
 $y = -7$

4. $y = 3(x-2)(x+1)^2$
 $y = 3(0-2)(0+1)^2$
 $y = -6$

Determine the end behavior of the graph of each polynomial function.

5. $y = 4x - 2x^2 + 1$
 D: 2 (even)
 LC: -2 (-) ↓ ↓

6. $y = 3x + 3x^3 - 5x^3 + 4$
 $-2x^3$
 D: 3 (odd)
 LC: -2 (-) ↑ ↓

	Degree	
	even	odd
L.C. +	↑ ↑	↓ ↑
-	↓ ↓	↑ ↓

7. $y = x^7 - 4$
 D: 7 (odd)
 LC: 1 (+) ↓ ↑

8. $y = 2x^4 + 3x + 1$
 D: 4 (even)
 LC: 2 (+) ↑ ↑

Simplify. Write in Standard Form.

9. $(5n^2 - 8)(8n - 5)$
 $40n^3 - 25n^2 - 64n + 40$

10. $-4y^2(4y^4 - 3y - 2)$
 $-16y^6 + 12y^3 + 8y^2$

11. $g(g+4) - g(4g^2 - 2)$
 $g^2 + 4g - 4g^3 + 2g$
 $-4g^3 + g^2 + 6g$

12. $(6d - 10d^3 + 3d^2) - (5d^3 + 3d - 4)$
 $6d - 10d^3 + 3d^2 - 5d^3 - 3d + 4$
 $-15d^3 + 3d^2 + 3d + 4$

13. $(4r^3 + 1)(r - 8)$
 $4r^4 - 32r^3 + r - 8$

14. $(8p^3 - 6p + 2p^2) + (9p^2 - 5p - 11)$
 ~~$8p^3 - 6p + 2p^2 + 9p^2 - 5p - 11$~~
 $8p^3 + 11p^2 - 11p - 11$

Divide using long division.

15. $(x^3 - x^2 - 24x - 15) \div (x + 4)$

$$\begin{array}{r} x^2 - 5x - 4 \\ x+4 \overline{) x^3 - x^2 - 24x - 15} \\ \underline{-(x^3 + 4x^2)} \\ -5x^2 - 24x - 15 \\ \underline{-(-5x^2 - 20x)} \\ -4x - 15 \\ \underline{-(-4x - 16)} \\ 1 \end{array}$$

$$x^2 - 5x - 4 + \frac{1}{x+4}$$

17. $(x^3 + 6x - 5) \div (x^2 - 3)$

$$\begin{array}{r} x \\ x^2-3 \overline{) x^3 + 0x^2 + 6x - 5} \\ \underline{-(x^3 - 3x)} \\ 9x - 5 \end{array}$$

$$x + \frac{9x-5}{x^2-3}$$

16. $(3x^2 - 12x - 7) \div (3x + 6)$

$$\begin{array}{r} x-6 \\ 3x+6 \overline{) 3x^2 - 12x - 7} \\ \underline{-(3x^2 + 6x)} \\ -18x - 7 \\ \underline{-(-18x - 36)} \\ 29 \end{array}$$

$$x-6 + \frac{29}{3x+6}$$

18. $(x^4 - 5) \div (2x^2 - 4)$

$$\begin{array}{r} \frac{1}{2}x^2 + 1 \\ 2x^2-4 \overline{) x^4 + 0x^3 + 0x^2 + 0x - 5} \\ \underline{-(x^4 - 2x^2)} \\ 2x^2 - 5 \\ \underline{-(2x^2 - 4)} \\ -1 \end{array}$$

$$\frac{1}{2}x^2 + 1 + \frac{-1}{2x^2-4}$$

Divide using synthetic division.

19. $\frac{x^3 + 3x^2 - 7x - 18}{x+2}$

$$\begin{array}{r} -2 \overline{) 1 \quad 3 \quad -7 \quad -18} \\ \underline{-2 \quad -2 \quad 18} \\ 1 \quad 1 \quad -9 \quad 0 \end{array}$$

$$x^2 + x - 9$$

Use Pascal's Triangle to expand.

21. $(x+3)^5$

$$\begin{array}{l} 1(x)^5(5)^0 \\ 5(x)^4(5)^1 \\ 10(x)^3(5)^2 \\ 10(x)^2(5)^3 \\ 5(x)^1(5)^4 \\ 1(x)^0(5)^5 \end{array}$$

$$x^5 + 15x^4 + 90x^3 + 270x^2 + 405x + 243$$

20. $(x^3 + 2x - 3) \div (x - 3)$

$$\begin{array}{r} 3 \overline{) 1 \quad 0 \quad 2 \quad -3} \\ \underline{ 3 \quad 9 \quad 33} \\ 1 \quad 3 \quad 11 \quad 30 \end{array}$$

$$x^2 + 3x + 11 + \frac{30}{x-3}$$

22. $(2x-5)^4$

$$\begin{array}{l} 1(2x)^4(-5)^0 = 16x^4 \\ 4(2x)^3(-5)^1 = -160x^3 \\ 6(2x)^2(-5)^2 = 600x^2 \\ 4(2x)^1(-5)^3 = -1000x \\ 1(2x)^0(-5)^4 = +625 \end{array}$$

$$16x^4 - 160x^3 + 600x^2 - 1000x + 625$$

