Algebra II CP

# Chapter 5 Test Review

Name: Key

**Simplify the following expressions using the exponential rules:**

1. $x^{5} \cdot x^{7} \cdot x$
$x^{13}$

2. $(2x^{3})^{4}$
$2^{4}x^{12}x^{4}$

3. $(4x^{2})^{-2}$
$4^{-2}x^{-4}$
$4^{-2}x^{-4}$

4. $\left(\frac{x^{2}}{y^{3}}\right)^{-2}$
$\frac{x^{-4}}{y^{-6}}$

5. $\left(\frac{3x^{2}}{2y^{3}}\right)^{-3}$
$\frac{3^{-3}x^{6}}{2^{-3}y^{-9}}$

6. $(x)^{0}$
$x^{0} = 1$

7. $5x^{3}y^{-2} \cdot 3x^{-5}y^{3}$
$5^{1}3^{1}x^{3}x^{-5}y^{-2}y^{3}$
$5^{1}3^{1}x^{-2}y^{1} = 15x^{-2}y$

8. $\frac{2x^{3}y^{-2}}{4x^{-1}y^{3}}$
$\frac{2^{1}x^{3}x^{1}y^{-2}}{4^{1}y^{3}} = \frac{x^{4}y^{-2}}{2y^{3}}$

9. $\left(\frac{x^{-3}}{y^{2}}\right)^{-3}$
$\frac{x^{9}}{y^{-6}} = x^{9}y^{6}$

10. $\frac{4x^{2}}{3x^{-1}} \cdot \frac{3x^{-1}}{x^{2}}$
$\frac{12x^{2}x^{-1}}{3x^{-1}x^{2}} = \frac{12x}{3x^{1}} = 4$

11. $\left(\frac{2x^{-1}}{3y^{2}}\right)^{-2} \cdot \frac{3x^{-3}y^{-1}}{y^{-2}}$
$\frac{2^{-2}x^{2}}{3^{-2}y^{-4}} \cdot \frac{3^{1}x^{-3}y^{-1}}{y^{-2}} = \frac{3^{2}x^{-1}}{2^{2}y^{2}}$

12. $\frac{x^{-3}y^{2}}{x^{2}y^{-1}} \cdot \frac{x^{-1}y^{-2}}{y^{3}}$
$\frac{x^{-4}y^{1}}{x^{1}y^{4}} = x^{-5}$

**Describe the following and fill in the missing information:**

13. $g(x) = x^{4} - 3x^{3} - 2x^{2} + 4$

Polynomial Function: Yes
Standard Form: $g(x) = 2x^{4} - 3x^{3} - 7x^{2} + 3x + 10$
Degree: 4 EVEN
Type: QUARTIC
Leading Coefficient: 2
End Behavior: $g(x) \to +\infty$ as $x \to -\infty$, $g(x) \to +\infty$ as $x \to +\infty$

14. $f(x) = 3x^{5} - 2x^{3} + 4x$

Polynomial Function: Yes
Standard Form: $f(x) = 3x^{5} - 2x^{3} + 4x + 0$
Degree: 5 ODD
Type: QUINTIC
Leading Coefficient: 3
End Behavior: $f(x) \to -\infty$ as $x \to -\infty$, $f(x) \to +\infty$ as $x \to +\infty$

**Perform the indicated operations. Describe the end behavior of the simplified polynomial:**

15. $(3x^{3} - 2x^{2} + 5x - 4)(x^{2} + 3x - 1)$
$3x^{5} + 9x^{4} - 3x^{3} - 2x^{4} - 6x^{3} + 2x^{2} + 5x^{3} + 15x^{2} - 5x - 4x^{2} - 12x + 4$
$f(x) = 3x^{5} + 7x^{4} - 4x^{3} + 9x^{2} - 17x + 4$
$f(x) \to -\infty$ as $x \to -\infty$, $f(x) \to +\infty$ as $x \to +\infty$

16. $(2x^{2} - 3x + 1)(x^{2} + 4x - 5)$
$2x^{4} + 8x^{3} - 10x^{2} - 3x^{3} - 12x^{2} + 15x + x^{2} + 4x - 5$
$g(x) = 2x^{4} + 5x^{3} - 21x^{2} + 19x - 5$
$g(x) \to -\infty$ as $x \to -\infty$, $g(x) \to +\infty$ as $x \to +\infty$