Name _____ Date _____

Ms. Schmidt Intermediate Algebra

Final Review #7 – Mixed Review

1) Simplify

a) $\frac{20x^6}{5x}$ $4x^5$

b) $\frac{-45a^4b^5c}{9a^2b}$ $-5a^2b^4$

c) $\frac{a^{-4}b^{-5}c}{a^2b^{-1}c}$ $\frac{1}{a^6b^4}$

2) If $h(x) = x^2 + 2x$ and $g(x) = 2x - 6$ find, $g(h(-4))$.

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

$16 - 8$

8

$g(8) = 2(8) - 6$

$16 - 6$

$\boxed{10}$

3) What is the domain of the function: $f(x) = \{(8,2), (19,1), (22,-3), (34,8), (35,2)\}$

$D: \{8, 19, 22, 34, 35\}$

4) What is the inverse of $f(x) = 3x - 19$ and solve for $f^{-1}(x)$ in terms of x.

$x = 3y - 19$

$\frac{x + 19}{3} = f^{-1}(x)$

5) Given $f(x) = x^2$ and $h(x) = 4x - 1$, find $f(g(x))$.

$(4x-1)^2$

$(4x-1)(4x-1)$

$16x^2 - 4x - 4x + 1$

$16x^2 - 8x + 1$

6) Simplify each radical

a) $\sqrt{8}$

$\sqrt{4}\ \sqrt{2}$

$2\sqrt{2}$

b) $\sqrt{500}$

$\sqrt{100}\ \sqrt{5}$

$10\sqrt{5}$

c) $\sqrt{18}$

$\sqrt{9}\ \sqrt{2}$

$3\sqrt{2}$

7) Given $h(x) = 4x^2 - x - 5$ and $g(x) = -2x^2 - 7$. Subtract g(x) from h(x).

$4x^2 - x - 5 - (-2x^2 - 7)$

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

$6x^2 - x + 2$

8) Find the product of $10a^{-1}$ and $3a^{-8}$.

$3a^{-9} = \frac{3}{a^9}$

9) Factor completely each of the following expressions.

a) $15x^2 - 5x$

$5x(3x - 1)$

b) $4x^3 - 20x^2 - 56x$

$4x(x^2 - 5x - 14)$

$4x(x - 7)(x + 2)$

c) $10x^2 - 2x$

$2x(5x - 1)$

10) Simplify: $7\sqrt{3} - 4\sqrt{27} + \sqrt{12}$

$\sqrt{9}\ \sqrt{3}$ $\sqrt{4}\ \sqrt{3}$

$-4 \cdot 3\sqrt{3}$ $2\sqrt{3}$

$7\sqrt{3} - 12\sqrt{3} + 2\sqrt{3}$

$-3\sqrt{3}$

11) Solve for x by factoring.

a) $x^2 - 21x + 20 = 0$

$(x-20)(x-1)=0$

$x=20 \quad x=1$

b) $x^2 - x - 20 = 0$

$(x-5)(x+4)=0$

$x=5 \quad x=-4$

12) Rationalize each of the following:

a. $\frac{5}{\sqrt{2}} \frac{\sqrt{2}}{\sqrt{2}}$

$\frac{5\sqrt{2}}{2}$

b. $\frac{9}{\sqrt{3}} \frac{\sqrt{3}}{\sqrt{3}}$

$\frac{9\sqrt{3}}{3} = 3\sqrt{3}$

c. $\frac{2}{\sqrt{3}} \frac{\sqrt{3}}{\sqrt{3}}$

$\frac{2\sqrt{3}}{3}$

13) Determine if the following lines are parallel, perpendicular or neither.

a. $2y = x - 10$
$y = -2x + 8$

$y = \frac{1}{2}x - 5$

Perpendicular

b. $y - 5x = 7$
$2y = 10x + 4$

$y = 5x + 7$

$y = 5x + 2$

Parallel

14) Solve for x:

a) $|2x + 2| = 10$

$2x+2=10 \quad -(2x+2)=10$

$2x=8 \quad -2x-2=10$

$x=4 \quad -2x=12$

$x=-6$

b) $|6x - 12| = 18$

$6x-12=18 \quad -(6x-12)=18$

$6x=30 \quad -6x+12=18$

$x=5 \quad -6x=6$

$x=-1$

15) Find the roots of the equation by using the quadratic formula: $2x^2 - 7x - 3 = 0$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$\frac{-(-7) \pm \sqrt{(-7)^2 - 4(2)(-3)}}{2(2)}$$

$$\frac{7 \pm \sqrt{73}}{4}$$

16) Use the triangle to the right.

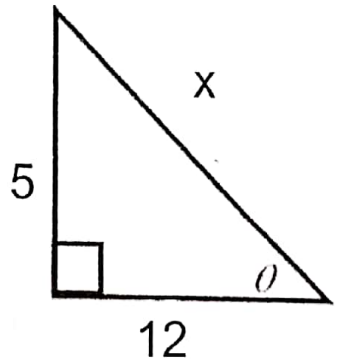
a. Find the value of x.

$a^2 + b^2 = c^2$

$5^2 + 12^2 = x^2$

$169 = x^2$

$x = 13$



b. Find the value of angle θ. Round your answer to the nearest degree.

$\tan^{-1}(5/12$

$\theta = 23°$

17) Solve each of the following for x:

a) $6^{2x+1} = 6^{3x-2}$

$2x + 1 = 3x - 2$

$1 = 3x - 2$

$3 = 3x$

b) $3^{2(x+1)} = 3^{3(x-1)}$

$2(x+1) = 3(x-1)$

$2x + 2 = 3x - 3$

$2 = x - 3$

$5 = x$

c) $9^{2(2x+1)} = 9^{5x-1}$

$2(2x+1) = 5x - 1$

$4x + 2 = 5x - 1$

$2 = x - 1$

$3 = x$