College Algebra Final Exam Review 3

Chapter 1

Solve for x.

1. $|3x - 1| = 5$

3x – 1 = 5 *3x – 1 = -5*
3x = 6 *3x = -4*
x = 2 *x = -4/3*

2. $x^2 - 3x = -8$

$X^2 - 3x + 8 = 0$

$$\frac{3 \pm \sqrt{9 - 4 \cdot 1 \cdot 8}}{2} = \frac{3 \pm i\sqrt{23}}{2}$$

3. $1 - \frac{3}{x+5} = \frac{15}{x^2 + 5x}$

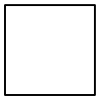
$x^2 + 5x - 3x = 15$
$x^2 + 2x - 15 = 0$
$(x - 3)(x + 5) = 0$
-5 won't work, x = 3

4. $\sqrt{2x + 3} = 1 - x$

$2x + 3 = 1 - 2x + x^2$
$0 = x^2 - 4x - 2$
X = $2 \pm \sqrt{6}$ *, but only* $2 - \sqrt{6}$ *works*

5. You want to buy a rectangular rug for a room that is 13 ft. x 17 ft. You need to leave a uniform strip of floor around the rug. You can afford to buy 140 sq. ft. of carpeting. What are the dimensions will the rug have?

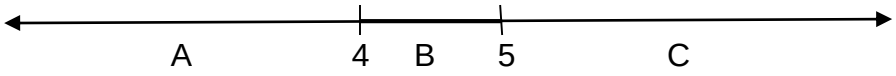
Each side = x



(13 – 2x)(17 – 2x) = 140
X = 13.5 or 1.5
13.5 won't work, so x = 1.5 and the dimensions are 10 x 14

6. Solve. $\frac{3}{x-4} - 3 \geq 0$ Write your answer in interval notation and draw a number line.

$$\frac{3}{x-4} - \frac{3(x-4)}{x-4} \geq 0$$



Check each interval: A and C won't work, so (4, 5] is the solution

Chapter 2

7. Write the equation for the line through (1, -4) perpendicular to 4x – 2y = 7

m = 2
y + 4 = -1/2(x – 1)

y = -1/2x -7/2

or x + 2y = -7

8. f(x) = x^2 – 2x + 4 and g(x) = 2x – 1. Find $(f \circ g)(x)$

$(2x - 1)^2 - 2(2x - 1)$
$= 4x^2 - 4x + 1 - 4x + 2 + 4$

$= 4x^2 - 8x + 7$

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9. Identify the y coordinate of the vertex of $y = x^2 + 6x + 6$

h = -6/2 = -3
k = f(h) = f(-3) = -3
The y-coordinate is -3

10. Divide $\frac{x^3 - 1}{x + 2}$

-2 | 1 0 0 -1
-2 4 -8
1 -2 4 -9
x^2 -2x +4 + -9/(x+2)

Chapter 3

11. Write an equation for a rational function a vert. asympt. of y = 2 and a horiz. asymp of x = 0. It has an x-int. of $-\frac{3}{2}$ and a y-int of $-\frac{3}{2}$.

$Ans: \frac{-2(2x+3)}{(x-2)^2}$

12. R varies jointly as f and the square root of H. R = 0.00077 when h = 3 and f = 1.

Find R when h = 4 and f = 2.

Solution:

$R = kf\sqrt{h}$

$7.7\ x\ 10^4 = k \cdot 1 \cdot \sqrt{3}$

$k = .0004445597073$

$R = .0004 \cdot 2 \cdot \sqrt{4} = .0016$

Chapter 4

13. Use the appropriate formula to find the future value of $3986 invested for 8 years at 3% interest compounded quarterly.

$3986(1 + (.03/4))^{4*8} = \$5062.66$

14. Given $\log_a 2 = 0.4307$ and $\log_a 3 = 0.6826$, find the value of $\log_a 24$.

$\log_a 2^3 * 3 = 3\log_a 2 + \log_a 3$
$= 3(.4307) + .6826$
$= 1.9747$