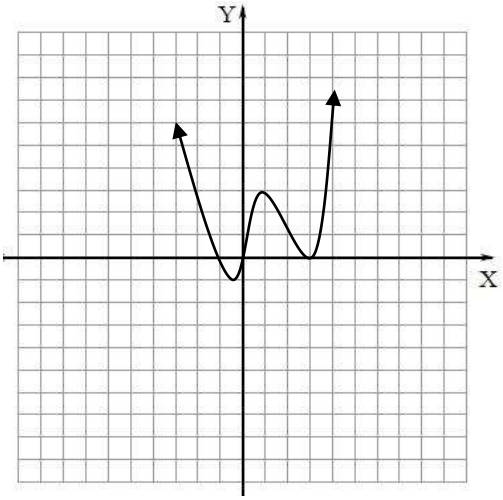
Math 1111: College Algebra Name_____
Review Material

1. f(x) is a degree 4 polynomial whose graph is shown below. Use the graph to factor f(x).



Zeros are -1, 0, 3 (bounce)

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

2. Find a rational function with the following features:

   x-intercepts at 5 and 3; y-intercepts at 15;
   vertical asymptote at x = 1; horizontal asymptote at y = 1

$$\frac{(x - 5)(x - 3)}{(x - 1)^2}$$

3. Find the horizontal asymptote of the given function: $g(x) = \dfrac{x + 7}{x^2 - 3}$

   Deg = 1 *so y = 0*
   Deg = 2

4. Write an equation for a function with a hole in its graph at x = 3.

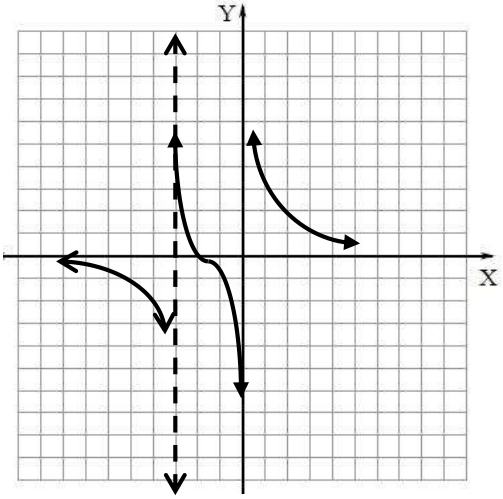
   (x – 3) (anything)
   (x – 3)(anything)

5. In the following formula, f(x) is the minimum number of hours of studying required to attain a test score of x: $f(x) = \dfrac{0.55x}{125.5 - x}$. How many hours of study are needed to score a 90?

$$f(x) = \frac{0.55(90)}{125.5 - 90} = 1.39 \text{ hours}$$

College Algebra Review 2

6. Find an equation for the rational function whose graph is shown below.



Follow these steps: 1) Find the vertical asymptotes.
2) Find the horizontal asymptotes
3) Find the x-intercept.

$$\frac{(x+2)}{x(x+3)}$$

7. If f varies jointly as q^2 and h, and f = 64 when q = 6 and h = 2, find q when f = 160 and h = 5.

$$F = kq^2h \Rightarrow 64 = f(6^2)(2) \Rightarrow f = 8/9 \Rightarrow\Rightarrow 160 = (8/9)q^2(5) \Rightarrow \underline{q = 6}$$

8. Solve for x: $e^{x-6} = \left(\frac{1}{e^4}\right)^{x+6}$

$$e^{x-6} = e^{-4(x+6)}$$
$$x - 6 = -4x - 24$$
$$x = \frac{-18}{5}$$

9. Find the future value of $6996 invested for 8 years at 5% compounded quarterly.

$$6996\left(1 + \frac{.05}{4}\right)^{(4)(8)} = \$10,410.96$$

10. The number of reports of a certain virus has increased exponentially since 1960. The number of cases can be approximated using the functions $r(t) = 54e^{0.006t}$, where t is the number of years since 1960. Estimate the number of cases in the year 2000.

$$r(t) = 54e^{.006(40)} = 69 \text{ cases}$$

College Algebra Review 2

11. Solve for x: $\log_7 343 = x$

$7^x = 343$ since $7^3 = 343$, $x = 3$

OR

$\log 7^x = \log 343 \Rightarrow x\log 7 = \log 343 \Rightarrow\Rightarrow x = 3$

12. Write the expression as a sum difference, or product of logarithms. Assume that all variables represent positive real numbers. $\log_a(8x^2y^3)$

$\log_a 8 + 2\log_a x + 3\log_a y$

13. Given that $\log_a 2 = 0.301$ and $\log_a 3 = 0.4771$, find $\log_a \sqrt{48}$

$(1/2)\log 48 = ½[\log 6 + \log 8] = ½[\log 2 + \log 3 + 3\log 2] = 0.8406$

14. Solve the rational inequality. Write the solution in interval notation and on a number line.

$\frac{(2x-3)(3x+8)}{(x-6)} \geq 0$ $\left[-\frac{8}{3}, \frac{3}{2}\right] \cup (6, \infty)$

15. Solve the rational inequality. Write the solution in interval notation and on a number line.

$\frac{(x-9)(x+7)}{(x-8)} \leq 0$ $(-\infty, -7] \cup (8, 9]$

College Algebra Review 2

16. Write the equation for the line through (-2, -1) perpendicular to -3x - 8y = -32

$M = -\frac{3}{8}$ $\quad -1 = \frac{8}{3}(-2) + b$ $\quad b = \frac{13}{3}$ $\quad y = \frac{8}{3}x + \frac{13}{3}$

17. Write the equation for the line through (4, -2) parallel to 2x – y = 5

$M = 2$ $\quad -2 = 2(4) + b$ $\quad b = -10$ $\quad y = 2x - 10$

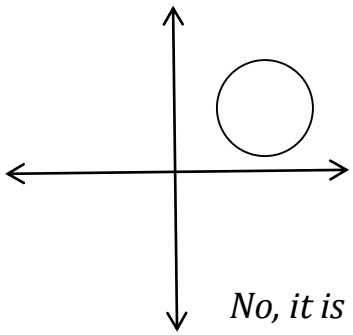
18. Determine whether the relation defines a function. Explain

a)

# of Rounds of Golf Played in the U.S.	
Year(x)	# Rounds (y)
1997	547,200,000
1998	528,500,000
1999	564,100,000
2000	587,100,000

Yes, it is a function

B.



No, it is not a funct.

19. Solve the system of inequalities

2x + 8y = 3
4x – 12y = -1

(1/2, ¼)

20. Solve the system of inequalities: $x + y \leq 4$
$5x - y \geq 8$