Math 253, Fall 2009 Name_____
Gonzalez

Test #2

Directions: Please show all your work since partial credit is given. Answers without the necessary work will receive no credit. And remember, relax and have fun!

1. Solve the following *equations*.

a) $y(3y-2)=8$ _____

b) $t^2(t-2)=8t$ _____

c) $\dfrac{3z}{z-2}=\dfrac{9}{z-4}$ _____

d) $\dfrac{9}{x^2+7x+10}=\dfrac{5}{x+2}-\dfrac{3}{x+5}$ _____

2. A cabin cruiser traveling with the current went 60 miles in 3 hours. On the return trip, it took 2 hours longer traveling against the current. Find the rate of the cabin cruiser in calm water and the rate of the current.

Cruiser: _____

Current: _____

3. The height of a triangle is 4 cm more than twice the length of the base. (Hint: Draw a picture.)

a) Find an equation for A, the area of the triangle, as a function of b, the length of the base.(Hint: $A = \frac{1}{2}bh$) _____

b) Use your model in part a) to determine the length of the triangle with area $35\ \text{cm}^2$.

_____

4. For the following functions, please state their *domains.*

a) $P(x) = x(7x+1)(3x-2)$

Domain:_____

b) $r(t) = \dfrac{5t-1}{81t^2-4}$

Domain:_____

5. Graph the solution set to the system of inequalities $\begin{aligned} 2x+y &< 3 \\ -6x+3y &\geq 4 \end{aligned}$

6. Simplify the following *expressions*.

a) $\left(2a^{-5}b\right)\left(5a^{4}b^{-3}\right)$ _____

b) $\left(12x^{2}y^{2}-16xy^{2}-8x\right)\div\left(4xy\right)$

_____

c) $\left(\dfrac{3k^{4}t^{-1}}{4k^{3}t^{2}}\right)^{2}$ _____

d) $\dfrac{\dfrac{3}{2a-3}+2}{\dfrac{-6}{2a-3}-4}$ _____

7. A ski resort can "manufacture" enough snow to open its steepest run in 12 hours. On the other hand, naturally falling snow would have to last for 36 hours to provide enough snow. If the resort works together with the natural snow, how long will it be before the run can be opened?

_____

8. Simplify the following *rational expressions*.

a) $\dfrac{x^2+x-6}{3x^3-12x^2}\cdot\dfrac{x^2-16}{x^2-4x+4}$ _____

b) $\dfrac{3x-4}{4x+1}+\dfrac{3x+6}{4x^2+9x+2}$ _____

9. Solve the *literal equation* $P = \dfrac{R - C}{n}$ for R.

_____

10. Solve the following *system of equations* by the method of your choice.

a)
$$\begin{aligned} 2x + 5y &= 4 \\ 3x + 6y &= -3 \end{aligned}$$
_____

b)
$$\begin{aligned} x - 4y &= 7 \\ x &= -3 + 4y \end{aligned}$$
_____