MATH 1520 **Quiz 1** **January 23, 2008**

1. Solve each equation.

[4] (a) $16^{-x+1} = 8^x$

[4] (b) $16^{x+2} = 64^{2x-1}$

[3] (c) $4^x = 8^{x+1}$

[3] (d) $25^x = 125^{x-2}$

[3] (e) $(e^4)^{-2x} = e^{-x+1}$

[2] 2. Solve for $y$ in the exponential equation $2^y = e^x$.

[2] 3. Solve for $y$ in the exponential equation $2^y = 3^x$.

[2] 4. Find the domain and range of the function $f(x) = (x-2)^2$.

[2] 5. Find the domain and range of the function $f(x) = \sqrt{3x+5}$.

[3] 6. Find the domain and range of the function $f(x) = (3x+5)^{1/2}$..

[3] 7. Find the domain and range of the function $f(x) = \dfrac{2}{x-1}$.

8. (Supply and Demand) Suppose the demand and price of a certain product are related by

$$p = D(q) = 16 - \frac{5}{4}q,$$

and suppose the supply and price are related by

$$p = S(q) = \frac{3}{4}q.$$

[1] (a) What price should be set if the demand is 4 units?

[3] (b) Find the equilibrium quantity for product.

9. (Cost Analysis) Suppose a certain product has the cost function

$$C(x) = 5x + 25,$$

and each unit of this product is sold for \$10.

[1] (a) Write the revenue function, $R(x)$, for this product.

[3] (b) Find the break-even quantity for this product.