Calculus I 21-111
Skills Assessment
Due January 18

Name:

Note: This assessment will not in any way affect your grade.

1. Simplify each of the following expressions as much as possible:

   (a) $x(y+z)-z(x+y)+2y(x-z)-3(3y-2z)$

   (b) $\frac{2}{5}-\frac{1}{2}+\frac{1}{3}$

   (c) $\frac{x}{x+2}-\frac{2}{x+1}$

(d) $2^{-2}x^2y^{-2}(2z)^3x^{-2}(2y)^3z^5$

(e) $\frac{\left(\frac{1}{2}x^{-2}y^2\right)^2}{\left(\frac{xy}{y^{-1}}\right)^{-1}}$

(f) $\sqrt{a^2b^2}$ (assume $a > 0$ and $b > 0$)

(g) $\sqrt{a^2 + b^2}$ (assume $a > 0$ and $b > 0$)

(h) $\left(\frac{9a^8}{16b^4}\right)^{-\frac{1}{2}}$

2. Determine all solutions to the following equations:

   (a) $3x - 7 = 5$

   (b) $x^2 - 5x + 6 = 0$

   (c) $2x^2 + 3x - 2 = 0$

   (d) $\frac{2x+1}{5} + \frac{3x+2}{2} = x$

3. Let $f(x) = 3x + 1$, and $g(x) = \frac{1}{x-1}$.

   (a) Evaluate $f(g(2))$.

   (b) Evaluate $g(f(2))$.

   (c) Give a simplified expression for $g(f(x))$.

4. Determine the equation of the line through the point $(2, 3)$ and having slope -2.

5. You pay \$21.20 for an item including a 6% sales tax in the cost. How much was the item without the tax?

6. Make a rough sketch of each of these functions: $f(x) = 2, g(x) = x, h(x) = x^2, j(x) = x^3, k(x) = -x^4, m(x) = 1/x, p(x) = |x|, q(x) = 2^x$.