Calculus I - Review Problems (Solutions)
Name:
Math 251.01 (02), Calculus I, Spring 2014

1. Evaluate the following without a calculator.
   (a) $16^{-3/4} = \frac{1}{8}$
   (b) $\left(\frac{2}{3}\right)^{-2} = \frac{9}{4}$
2. Simplify the expression $\left(\frac{3x^{3/2}y^3}{x^2y^{-1/2}}\right)^{-2} = \frac{x}{9y^7}$.
3. Expand and simplify $(\sqrt{a}+\sqrt{b})(\sqrt{a}-\sqrt{b}) = (a-b)$
4. Factor each expression
   (a) $4x^2 - 25 = (2x-5)(2x+5)$
   (b) $2x^2 + 5x - 12 = (2x-3)(x+4)$
5. Simplify the rational expression
   (a) $\frac{(x-1)}{\sqrt{x}-1} = \sqrt{x}+1$
   (b) $\frac{\frac{y}{x}-\frac{x}{y}}{\frac{1}{y}-\frac{1}{x}} = -(x+y)$
6. Rationalize and simplify the expression $\frac{\sqrt{4+h}-2}{h} = \frac{1}{\sqrt{4+h}+2}$
7. State whether each of the following expressions is true or false
   (a) $(p+q)^2 = p^2+q^2 (FALSE)$
   (b) $\sqrt{ab} = \sqrt{a}\sqrt{b} (TRUE)$
   (c) $\sqrt{a^2+b^2} = a+b (FALSE)$
   (d) $\frac{1}{x-y} = \frac{1}{x} - \frac{1}{y} (FALSE)$
8. Find the equation of a line that passes through $(2,-5)$ and has
   (a) has slope $-3 \Longrightarrow y = -3x+1$
   (b) is parallel to the x-axis. $\Longrightarrow y = -5$
   (c) Is parallel to the line $2x-4y=3 \Longrightarrow y = \frac{1}{2}x - 6$
9. If $f(x) = x^2$, evaluate the difference quotient $\frac{f(2+h)-f(2)}{h}$ and simplify your answer $\Longrightarrow (4+h)$.