Second Review for Math 06 Fall 2009

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Please note: You should fully justify your answers.

1. Graph the equation: $y = x^2 - 6x + 14$.
2. Graph the equation: $x^2 - 4x + y^2 + 10y = -25$
3. A parabola has vertex $(2, -8)$, axis of symmetry $x = 2$, and passes through the point $(4, 4)$. Find its equation.
4. A circle has center $(-2, 3)$ and passes through the point $(-6, 6)$. Find its equation.
5. Simplify the following expressions. Your answers should be fractions and should contain only positive exponents.
   (a) $32^{3/5}$
   (b) $27^{-\frac{3}{2}}$
   (c) $25^{-3/2}$
   (d) $\left(\dfrac{16x^{17}y^{13}}{x^9 y}\right)^{\frac{1}{4}}$
   (e) $\left(\dfrac{36a^5b^7c^8}{a^7b^5}\right)^{-\frac{3}{2}}$
6. Use a table of values to graph $y = \left(\dfrac{1}{3}\right)^x$.
7. Simplify each of the following expressions:
   (a) $\log_2 \dfrac{1}{64}$
   (b) $\log_3 \dfrac{\sqrt{27}}{81}$
   (c) $\log_5 50 + \log_5 10$
8. Solve the following equations:
   (a) $2^x = 64$
   (b) $3^{x-5} = 81$
   (c) $8^{2-4x} = \dfrac{1}{32}$
   (d) $3^{2-3x} = 3\sqrt{3}$
9. Prove that
   (a) $\sqrt{i} = \dfrac{\sqrt{2}}{2} + \dfrac{i\sqrt{2}}{2}$
   (b) $\sqrt{-5 - 12i} = 2 - 3i$