1. [5 pts. each] Simplify each root.

   (a) $\sqrt[6]{(-5)^6}$

   (b) $\sqrt{(-q)^2}$

2. [5 pts. each] Evaluate each exponential (show work, since you're supposed to be doing these by hand).

   (a) $64^{3/2}$

   (b) $32^{-3/5}$

3. [10 pts. each] Simplify each expression. Write all answers with positive exponents. Assume that all variables represent positive real numbers.

   (a) $r^{-8/9} \cdot r^{17/9}$

   (b) $\dfrac{m^{3/4}n^{-1/4}}{(m^2 n)^{1/2}}$

4. [10 pts. each] Simplify each radical. Assume variables represent positive numbers.

   (a) $\sqrt{18}$

   (b) $\sqrt{144x^3 y^9}$

   (c) $\sqrt[3]{-16z^5 t^7}$

   (d) $\sqrt{\dfrac{v^{13}}{169}}$

5. [10 pts. each] Simplify. Assume variables represent positive numbers.

   (a) $5\sqrt{8} + 3\sqrt{72} - 3\sqrt{50}$

   (b) $3\sqrt[4]{x^5 y} - 2x\sqrt[4]{xy}$

6. [10 pts.] Multiply, and then simplify the product: $(2\sqrt{3} + \sqrt{5})(3\sqrt{3} - 2\sqrt{5})$.

7. [10 pts. each] Rationalize the denominator in each expression. Assume variables represent positive numbers.

   (a) $\dfrac{-5}{\sqrt{24}}$

   (b) $\dfrac{4}{3 - \sqrt{7}}$

8. [10 pts. each] Solve each charming little radical equation.

   (a) $9 - \sqrt{4z + 1} = 0$

   (b) $w = \sqrt{w^2 - 4w - 8}$

   (c) $\sqrt[3]{2k - 11} - \sqrt[3]{5k + 1} = 0$

9. [10 pts. each] Subtract, multiply or divide the complex numbers as indicated, and write your answers in the form $a + bi$.

   (a) $(9 + i) - (5 + 6i)$

   (b) $3i(4 + 9i)$

   (c) $(4 + 3i)^2$

   (d) $\dfrac{29}{5 + 2i}$

10. [10 pts. each] Solve each enchanting little quadratic equation using the quadratic formula.

   (a) $(x - 3)(x + 5) = 2$

   (b) $x^2 + 4x + 11 = 0$

11. [15 pts.] Graph the parabola $y = (x - 2)^2 + 3$ by plotting at least four points. Give the vertex and axis.