

Directions: Please answer the following questions. **Show work!!**

1. The path that a rock takes as it is thrown from the roof of Hotel Blackhawk is represented by the equation $h(t) = -16t^2 + 48t + 100$, where t is the time in seconds and h is the height of the rock in feet.

a. Explain how to find the answer in the graphing calculator if I wanted to find out how long it took for the rock to hit the ground (do not actually find it; just explain how to find it).

b. Explain how to find the answer in the graphing calculator if I wanted to know how high the rock got in the air before hitting the ground (do not actually find it; just explain how to find it).

c. Explain how to find the answer in the graphing calculator if I wanted to know long it took the rock to get to its highest point (do not actually find it; just explain how to find it).

d. Without using a graphing calculator, how tall is Hotel Blackhawk?

2. Solve the system
$$\begin{cases} -4x + 7y = 2 \\ 3x + 4y = 17 \end{cases}$$

3. Simplify

a. i^{37}

b. i^{16}

c. i^{23}

d. i^{54}

4. Circle the expression(s) that are polynomials. If they are polynomials, rewrite in standard form.

a. $-\frac{1}{4}x - 6x^3$

b. $2x^3 + \frac{9}{x} - 10x^4$

c. $-7x^2 + 3x + 2^4 - 5x^8$

d. $-8x + 9^x + 10x^4$

5. Simplify

a. $8 - 2i - (4 - 7i)$

b. $(5 - i)(-3 + 6i)$

Solve by factoring.

6. $0 = 42x^2 + 14x$

7. $0 = 14x^2 - 11x + 2$

8. Write the equation for a line through (10, -2) and (6, -14).

Make sure you also know how to do all of the problems from Practice 6.