

Test Review 2.3 - Quadratics with Calculators (or not)

1) If $y = 3x^2 - 6x + 7$ was transformed into the form $y = a(x-h)^2 + k$, then what is the vertex point?

$$h = \frac{-(-6)}{2(3)} = 1 \quad \boxed{(1, 4)}$$

$$k = 4$$

2) Identify the k value of the vertex of the given equation: $y = -2(x-5)^2 - 9$

$$y = \underset{a}{-2}(\underset{h}{x-5})^2 + \underset{k}{-9}$$

$$\boxed{k = -9}$$

3) Change $y = -2(x-5)^2 - 9$ into standard form:

$$y = -2(x^2 - 10x + 25) - 9$$

$$y = -2x^2 + 20x - 50 - 9$$

$$\boxed{y = -2x^2 + 20x - 59}$$

4) Solve for x for the given equation:

$$-3x^2 + 30x - 84 = 0$$

$$x^2 - 10x + 28 = 0$$

$$(x-5)^2 = -3$$

$$\boxed{x = 5 \pm \sqrt{3}i}$$

5) Complete the table for the given equations:

x	y_1	y_2
-36	-14957	14995
2	-61	99
23	-6697	6735

a) $y_1 = -12x^2 - 16x + 19$

b) $y_2 = 12x^2 + 16x + 19$

6) A middle school kid threw a ball straight up in the air during P.E. while standing on the ground with an initial velocity of 80 ft/sec (~54.5 mph). His coach collected data from his throw, including the time and height of the ball.

Time (seconds)	Height (feet)
0	0
1	64
5	0

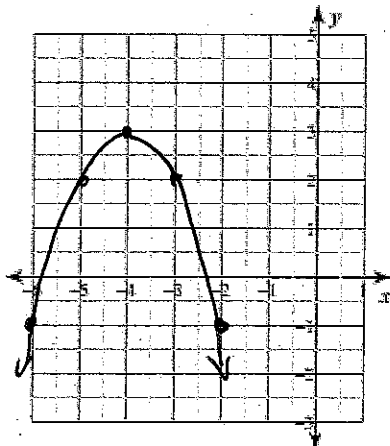
How high did the ball travel?

$$h(t) = -16t^2 + v_0t + h_0$$

$$k = \frac{-80}{2(-16)} = 2.5$$

$$h = -16t^2 + 80t \quad k = \boxed{100 \text{ ft}}$$

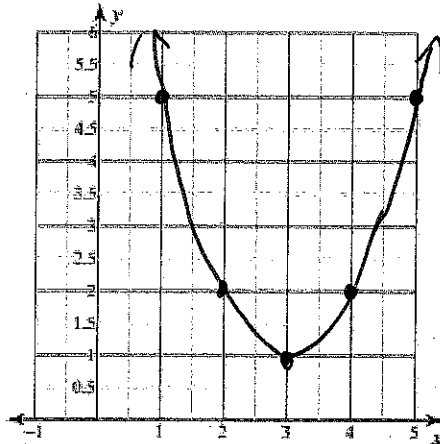
7) Graph: $f(x) = -x^2 - 8x - 13$



$$h = \frac{-8}{-2} = -4$$

$$k = 3$$

8) Graph: $f(x) = (x-3)^2 + 1$



9) Simplify: $(7-2i)+(-3-8i)$

$$\boxed{4-10i}$$

10) Simplify: $(3+15i)(-4-7i)$

$$\begin{aligned} & -12 - 21i - 60i - 105i^2 \\ & -12 - 21i - 60i + 105 \end{aligned}$$
$$\boxed{93-81i}$$

11) Simplify: $\frac{2+3i}{4-5i} \cdot \frac{4+5i}{4+5i} = \frac{8+10i+12i+15i^2}{16+20i-20i-25i^2}$

$$\boxed{\frac{-7+22i}{41}}$$

12) Simplify: $\frac{5\sqrt{11}}{\sqrt{7}} \cdot \frac{\sqrt{7}}{\sqrt{7}}$

$$\boxed{\frac{5\sqrt{77}}{7}}$$

13) Write the given equation in vertex form: (hint: completing the square is one way)

$$h = \frac{-(-32)}{2(4)} = \frac{32}{8} = 4$$

$$k = -61$$

$$a = 4$$

$$\boxed{y = 4(x-4)^2 - 61}$$

$$y = 4x^2 - 32x + 3$$

$$y = 4(x^2 - 8x + 16) + 3 - 64$$

$$\boxed{y = 4(x-4)^2 - 61}$$