Quadratics Station

1. Factor the following: $-36+1=-3 / \sqrt{2}$

$$
\text { c. } 2 x^{2}+5 x+2,4+1=5
$$

2. The path of a projectile shot out of a cannon follows the path modeleaby the equation $f(x)=-16 x^{2}+95 x+4$, when x is time in seconds and $\mathrm{f}(\mathrm{t})$ is height in feet.
a. What is the maximum height that the projectile reaches?
$\rightarrow$ Find with calc-max on calc or...

$$
x=\frac{-b}{2 a}
$$

b. What is the initial height of the projectile?

$$
h=4 \mathrm{ft}
$$

c. When will the projectile reach the ground?

$$
\begin{aligned}
& \text { Find } 2 \text { eos on call } \quad x=5.98 \text { seconds } \\
& \text { Fine reach the ground? }
\end{aligned}
$$

d. When does the projectile reach its maximum height?
$X$ value of mat $x=2.97 \quad 2.97$ seconds
e. When will the projectile reach 100 feet the first time?

Graph $y=100$ Find intersect
3. Solve the following:

b. $2 x^{2}+8 x=24$
$-90+1=-2$

$$
\begin{aligned}
& \text { a. } 16 x^{2}=4 \\
& 16 x^{2}-4=0 \\
& 4\left(x^{2}-1\right) \\
& 4(x-1)(x+1)=0 \\
& x-1=0, \frac{x+1=0}{x-1} x \\
& x=-1
\end{aligned}
$$

$$
\begin{array}{ll}
\text { b. } 2 x^{2}+8 x=24 \\
2 x^{2}+8 x-24=0 & -12+1=-4 \\
2\left(x^{2}+4 x-12\right)=0 & -6+2=-4 \\
\left(x^{2}+6 x\right)+(-2 x-12)=0 & 6-2=-4 \\
x(x+6)-2(x+6)=0 & \\
2(x+6)(x-2)=0 &
\end{array}
$$

$$
\text { f. } 3 x^{2}-13 x=30
$$

$$
-1 / 5+2=-4 / 3
$$

$$
-30+3=-24
$$

$$
-18+5=-13
$$

$$
\begin{aligned}
& 3 x(x-6)+5(x-6) \\
& (x-6)(3 x+5)=0
\end{aligned}
$$

$$
\left.\begin{array}{c|c}
x-6=0 \\
x=6
\end{array} \right\rvert\, \begin{aligned}
& 3 x+5=-5 / 3
\end{aligned}
$$

4. Suppose that the equation $V=20.8 x^{2}-458.3 x+3500$ represents the value of a carifom 1964 to 2002. What year did the car have the least value? ( $x=0$ in 1964

$$
\text { Table or graph }(\mathrm{min})
$$



$$
\begin{aligned}
& 36-36-18+2=-x+ \\
& \begin{array}{c}
\text { b. } \sqrt{x^{2}}-\sqrt{49} \text { Difference of } \\
x \quad 7 \text { Squares }
\end{array} \\
& \left(x^{2}+4 x^{2}+5 x-36-18+2=-12+3=-x\right. \\
& \begin{aligned}
(x+4 x)(-4 x-3 b)-9+4 & =-2 \\
9-4 & =5
\end{aligned} \\
& x(x+4)-4(x+4) \\
& (x+9)(x-4) \\
& \left(2 x^{2}+4 x\right)+(1 x+2) \\
& \frac{2(x+2)+1(x+7)}{(x+2)(2 x+1)}
\end{aligned}
$$

5. Which of the following statements is a correct comparison between the vertex for equation A and the vertex for equation $b$.

a. The $x$ and $y$ values of the vertex for equation $A$ is larger than the $x$ and $y$ values for equation $B$.
b. The $x$ value for equation $A$ is larger than equation $B$, and the $y$ value for equation $A$ is smaller than equation $B$.
c. The $x$ value for equation $B$ is larger than equation $A$, and the $y$ value for equation $B$ is smaller than equation $A$.
d. The $x$ and $y$ values of the vertex for equation $B$ is larger than the $x$ and $y$ values for equation $A$.
6. The area of a trapezoid is found using the equation $A=\frac{1}{2} h\left(b_{1}+b_{2}\right)$. Find the area of the trapezoid below. Simplify your answer.

7. The area of a rectangle is represented as $A=3 x^{2}-4 x-15$. If the area is 104 units $^{2}$ find the value of $x$.

Calculator INACTIVE Questions:
7. Which is the graph of the function $f(x)=4 x^{2}-8 x+7$ ?
a.

b.

C.

d.

8. The floor of a rectangular cage has a length 4 feet greater than its width, w. James will increase both dimensions of the floor by 2 feet. Which equation represents the new area, $N$, of the floor of the cage?

A $\quad N=w^{2}+4 w$
B $\quad N=w^{2}+6 w$
C $\quad N=w^{2}+6 w+8$
D $\quad N=w^{2}+8 w+12$
9. What is the smallest of 3 consecutive positive integers if the product of the smaller two integers is 5 less than 5 times the largest integer?
10. The function $f(t)=-5 t^{2}+20 t+60$ models the approximate height of an object $t$ seconds after it is launched. How many seconds does it take the object to hit the ground?

