Honors Math II
Unit 4 day 7

Name $\qquad$
Period $\qquad$ Date $\qquad$

Solve the following equations by:
a) factoring
b) completing the square
c) quadratic formula

1. $x^{2}+5 x+6=0$
2. $2 x^{2}+x-6=0$
3. $2 x^{2}-4 x=16$
4. $y=-3(x+1)^{2}+10$
a) Graph
b) vertex: ( , )
c) axis of symmetry: $x=$
d) $x$-intercept(s): (find exact value, check on calculator)

e) $y$-intercept:
f) domain:
g) range:
h) Intervals of increase and decrease:
i) End behavior:
5. $y=-2(x-2)^{2}+1$
a) Graph
b) vertex: ( , )
c) axis of symmetry: $x=$
d) $x$-intercept(s): (find exact value, check on calculator)

e) $y$-intercept:
f) domain:
g) range:
h) Intervals of increase and decrease:
i) End behavior:
6. $y=-3 x^{2}-12 x-5$
a) Graph
b) vertex: ( , )
c) axis of symmetry: $x=$
d) $x$-intercept(s): (find exact value, check on calculator)

e) $y$-intercept:
f) domain:
g) range:
h) Intervals of increase and decrease:
i) End behavior:
7. The function $y=-\frac{1}{16}(x-8)^{2}+4$ models the jump of a kangaroo in feet.
A) What is the kangaroo's maximum height?
B) How long is the kangaroo's jump?

8. Some harbor police departments have fire-fighting boats with water cannons. The boats are used to fight fires that occur within the harbor.
The function $y=-.0035(x-0)(x-143.9)$ models the path of the water shot by a water cannon in feet.
A) How far does a water cannon shoot?
B) What is the maximum height of the water?

9. The length of a rectangle is three more than twice the width. Determine the dimensions that will give a total area of $27 \mathrm{~m}^{2}$.
10. We are going to fence in a rectangular field and we know that for some reason we want the field to have an enclosed area of $75 \mathrm{ft}^{2}$. We also know that we want the length of the field to be 3 feet longer than the width of the field. What are the dimensions of the field?
11. A flare is launched from a boat. The height, $h$, in meters, of the flare above the water is approximately modeled by the function $h(t)=-15 t^{2}+150 t$, where $t$ is the number of seconds after the flare is launched. How many seconds will it take for the flare to hit the water?
12. A jump in inches on a pogo stick with a bow spring can be modeled by the following equation: $\quad y=-\frac{7}{6}(x-6)^{2}+42$
A) What is the maximum jump height in inches?
B) How far does the pogo stick go in the horizontal direction?

