## + Warm Up

$$
(3.5)^{2}-7(3.5)+6
$$

1) Given $f(x)=x^{2}-7 x+6$, state the following:
2) Vertex: $\frac{(35,-6.25) \circ((7 / 2,-25 / 4)}{7}$
3) AOS: $\quad x=\frac{-b}{2 a}=\frac{7}{2(1)}=\frac{1}{2} x=\frac{7}{2} 0.3 .5$
4) Max or Min Value: $\hat{\text { oo }}$

5) Y-Intercept:
6) X-Intercepts:

$$
\begin{array}{rl}
x-6=0 & x-1=0 \\
+6+6 & =0 \\
+1
\end{array}
$$

$$
0=x^{2}-7 x+6 \quad \begin{array}{cc}
x-6+6 & x+1 \\
(x-6)(x-1) & (6,0)
\end{array}
$$

I. For each graph fill in the blanks for the requested information.
a)
$y=3 x^{2}+6 x+2$

b) $y=x^{2}-4 x+6$

c)

$$
y=-2 x^{2}+16 x-28
$$



Vertex: $(-1,-1)$
zeroes: $(-1.58,0) \leftarrow(-.423,0)$
$y$-intercept: $(0,2)$
Axis of symmetry: $x=-1$
Decreasing interval: $x<-1$
Increasing interval: $x>-1$

Vertex: $(2,2)$
zeroes: No real zeros
$y$-intercept: $(0,6)$
Axis of symmetry: $\qquad$ $x=2$

Decreasing interval: $x<2$

Increasing interval: $\qquad$ $x>2$

Vertex: $(4,4)$
zeroes: $(5.41,0) \not(2.59,0)$ $y$-intercept: $(0,-28)$
Axis of symmetry: $x=4$
Decreasing interval: $x>4$
Increasing interval: $\qquad$

Graph the function above


$$
\begin{aligned}
& \text { Vertex: }(1,-2) \\
& \text { zeroes: }(0,0)+(2,0) \\
& y \text {-intercept: }(0,0) \\
& \text { Axis of symmetry: } x=1 \\
& \text { Decreasing interval: } x<1 \\
& \text { Increasing interval: } x>1
\end{aligned}
$$



| Equation | Axis of Symmetry | Vertex | Factor | $x$-intercept | $y$-intercept |
| :---: | :---: | :---: | :---: | :---: | :---: |
| $y=x^{2}+8 x+15$ | $\left[\begin{array}{c} -\frac{5}{2 a}=-8 \\ -\frac{8}{2} \\ x=-4 \end{array}\right]$ | $\begin{aligned} & (-4)^{2}+8(-4)+15 \\ & (-4,-1) \end{aligned}$ | $(x+5)(x+3)$ | $(-3,0)$ $(-5,0)$ | $(0,15)$ |

## Homework Answers l-4



## - For the equation $y=x^{2}-4 x+3$ find the:


-4. AOS
$x=\frac{4}{2(14)}=2$
-7. Graph:

3. y-intercept
$x=0 \quad y=3$
$y=(0)^{2}-4(0)^{2}+3$
6. $\mathrm{max} / \mathrm{min}$

$y=-1>$
Increasing Interval: $(2, \infty)$

Decreasing Interval: $(-\infty, 2)$
$\square$ For the equation $y>x^{2}-4 x+3$ find the:
$\square$ l. solution $\quad 2$. x-intercepts
3. y-intercept

■4. AOS
5. vertex (2,-1) 6, max/min


Increasing Interval:
■7. Graph:


Decreasing Interval:
$\square$ For the equation
$y=$ find the:

- 1. solution $0=2(x-4)^{2}+3$ $-3=2(x-4)^{2}$ -4. AOS $\pm \sqrt{-\frac{3}{2}+2 n}=x$

2. x-intercepts
0) $\left\lvert\, \begin{aligned} & y=0 \\ & y=2(0-4)^{2}+3 \\ & 2(-1)^{2}+3 \\ & 2.4+3\end{aligned}\right.$
3. $y$-intercept

$$
\begin{aligned}
& y=2(0-4)^{2}+3 \\
& 2(-4)+3
\end{aligned}
$$



■ 7. Graph: |  | 11 |
| :--- | :--- |
| 2 | 5 |
| 4 | 3 |
| 5 | 5 |
| 6 | 11 |


$\max / \mathrm{min}$

Increasing Interval:
$(4, \infty)$

Decreasing Interval:
$(-\infty, 4)$
$\square$ For the equation $y \leq 4 x^{2}-9$ find the:
-1. solution
2. x -intercepts
3. y-intercept
-4. AOS
5. vertex $(0,-9)$ 6. max $/ \min$
$x=0$
-7. Graph:



Increasing Interval:

Decreasing Interval:
l) A bottlenose dolphin jumps out of the water. The path the dolphin travels can be modeled by
$\widehat{h}=-0.2 d^{2}+2 d$, where $h$ represents the height of the dolphin and d represents the horizontal distance.
a) What is the maximum height the dolphin reached?

b) How far did the dolphin jump?

7. The amount of money that a freshman class fundraiser can raise can be modeled by the inequality $y \leq-2 x^{2}+16 x-24$, where x represents the number of days into the sale and $y$ represents the amount of money raised in hundreds.

- Graph the inequality.
$X=\frac{-1 \varphi}{(1-2)}=4 \quad(4,8)$
- What is the maximum and what does it represent?
- When will the fundraiser start to raise money? After Day 2
- How many days should the fundraiser last? Defend your answer.
- On which days will the sale make more than $\$ 400$ ? $\quad y>4$


2) Jaime owns a business making decorative boxes to store jewelry, mementos, and other valuables. The function $\mathrm{P}(\mathrm{x})=-x^{2}+50 x+1800$ models the profit $\mathrm{P}(\mathrm{x})$ that Jaime has made in month $x$ for the first two years of her business.
a) What was the initial start up cost of her business?

$$
\$-1800 \text { cost or } \$ 1800 \text { profit }
$$

b) During what month did Jamie make the most money?

$$
\text { month } 24
$$

c) What was the most Jamie made?

$$
82424
$$

3) A Field Hockey player makes a scoop that releases the ball with an upward velocity of $34 \mathrm{ft} / \mathrm{s}$. The function $h=-16 t^{2}+34 t$ models the height $h$ in feet of the ball at time t in seconds.
a) Does the ball ever reach 20 feet?

$$
\begin{aligned}
& 20=-16 t^{2}+34 t \\
& 0=-16 t^{2}+34 t-20 \text { Iqet } \\
& \text { imaginary } \\
& \text { solution }
\end{aligned}
$$

b) How high does the ball travel?


$$
17.5 \text { feet }
$$

c) How high is the ball at 2 seconds? At 3 seconds?
d) When will the ball reach the ground?

8. The profits of Julie's new company can be modeled by the equation $y \leq-x^{2}+8 x$, where $x$ is the number of months and $y$ is the profit in thousands of dollars.

- Graph the inequality. $X=\frac{-8}{2(-1)}$ $x=4 \quad y=16$
- What is the maximum? What does it represent?

$$
\text { Present? } \$ 16000 \text { profit }
$$

- How long is Julie's company profitable? 8 months $x=0-x(x-8)=0$
- Julie wants to know when her company made $\$ 12,000$ or more.
- Write the inequality that represents this situation and graph.

$$
-x^{2}+8 x \geq 12
$$



$$
-x^{2}+8 x-12=0
$$

$$
(-x+2)(x-6)
$$

+ Homework

HW4-2 \#1,2
HW4-3 \#1-7 Odd
Study for
Tuesday's quiz!!
Tutorials: Before school and Wednesday after school until 3:00 pm

