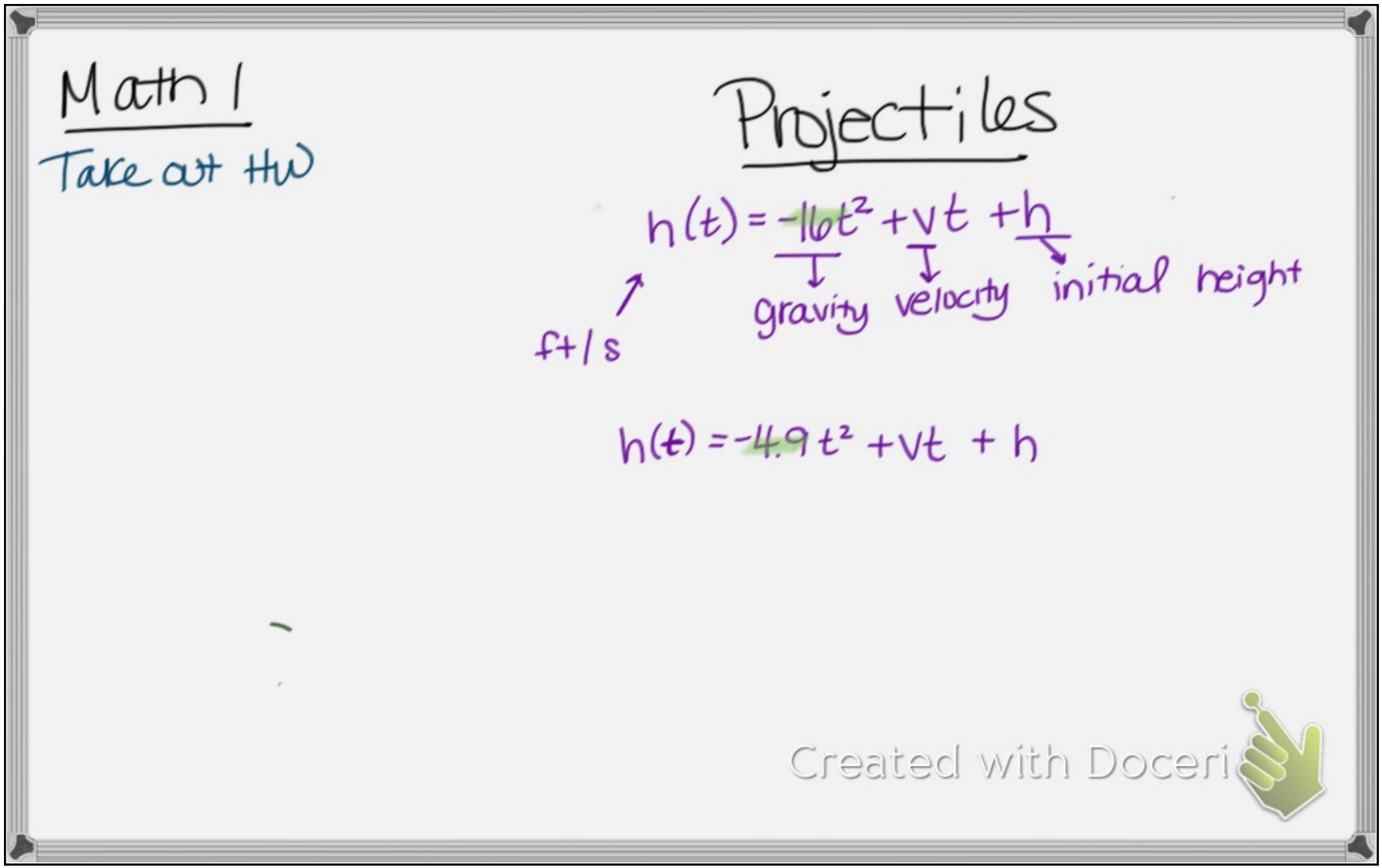

Math 1
Take out hw
Projectiles
$h(t) = -16t^2 + vt + h$
gravity
velocity
initial height
ft/s
$h(t) = -4.9t^2 + vt + h$
Created with Doceri

Practice: Quadratics

For each problem state the following. $-16t^2 + vt + h$

1. What is the initial height?
2. What is the initial velocity?
3. State whether the object was dropped or thrown?
4. What is the maximum height and when does it occur? vertex
5. When does the object hit the ground? x-int.

- $h = 30 - 16t^2 \rightarrow -16t^2 + 30$

1. 30ft 3. dropped
2. 0 ft/s

- $h = 24 - 16t^2$

1. 24ft 3. Dropped
2. 0ft/s

- $h = 144 - 16t^2$

1. 144ft 3. dropped.
2. 0ft/s

- $h = 6 + 40t - 16t^2$

1. 6ft 3. thrown up

2. 40 ft/s

- $h = 520 + 72t - 16t^2$

1. 520ft 3. thrown up

2. 72 ft/s

- $h = 4 + 48t - 16t^2$

1. 4ft 3. thrown up

2. 48ft/s

$-16t^2$
$\pm vt$
$+ h$

Practice

1. A baton twirler tosses a baton into the air. The baton leaves the twirler's hand 6 feet above the ground and has an initial vertical velocity of 45 feet per second. The twirler catches the baton when it falls back to a height of 5 feet. For how long is the baton in the air?

$-16t^2 + 45t + 6 = 5$

2. A man tosses a penny up into the air above a 100-feet deep well with a velocity of 5 feet/second. The penny leaves the man's hand at a height of 4ft. How long will it take the penny to reach the bottom of the well?

$-16t^2 + 5t + 104 = 0$

3. Explain why the height model $h = -16t^2 + vt + h$ applies not only to launched or thrown objects, but to dropped objects as well.

v of is 0

$-16t^2 + \cancel{0t} + h$

$-16t^2 + h$

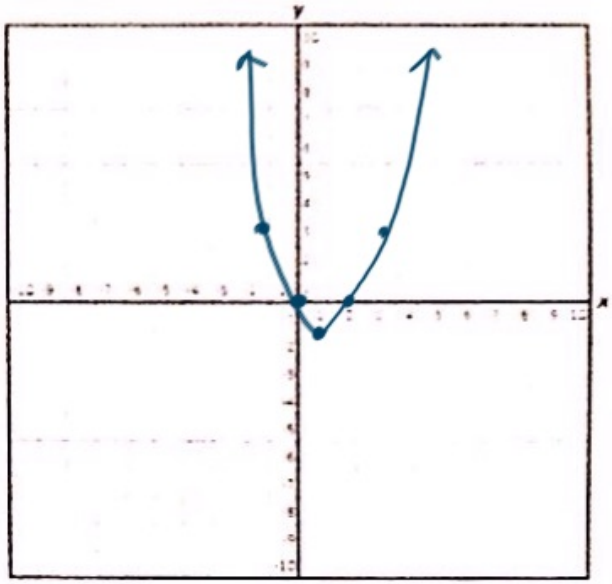
4. In a volleyball game, a player on one team spikes the ball over the net when the ball is 10 feet above the court. The spike drives the ball downward with an initial vertical velocity of -55 feet per second. Players on the opposing team must hit the ball back over the net before the ball touches the court. How much time do the opposing players have to hit the spiked ball?

$-16t^2 - 55t + 10 = 0$

2. $f(x) = x^2 - 2x$

a. Look at the table in your calculator and find the Vertex.

(1, -1)



b. Build a table with the values around the vertex.

x	-2	-1	0	1	2	3	4
y	8	3	0	-1	0	3	8

c. The vertex is located at (1 , -1), and it is a Max or (Min?)

d. The axis of symmetry is x = 1

e. The graph opens (UP) or DOWN because the a-value is positive.

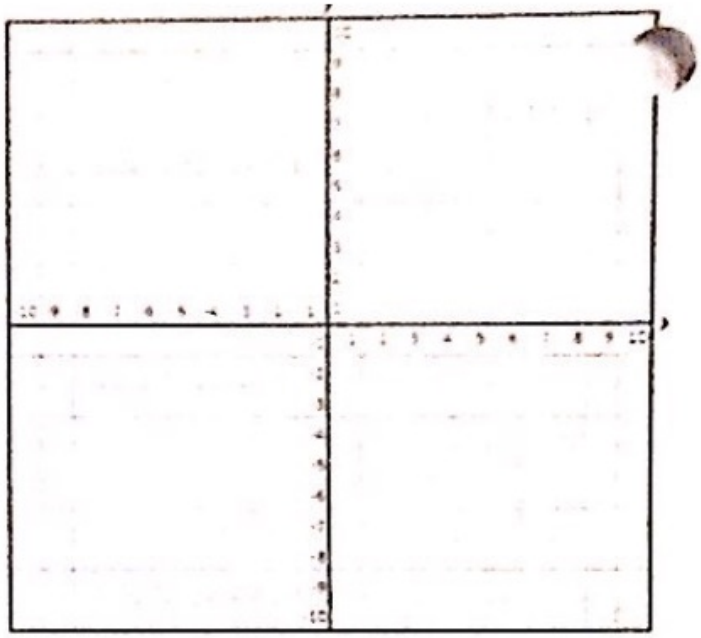
f. The x-intercepts are at (0, 0) *and* (2 , 0). → y=0

g. The y-intercept is at (0, 0) → x=0

4. $f(x) = x^2 + 2x - 8$

a. Look at the table in your calculator and find the Vertex.

(-1, -9)



b. Build a table with the values around the vertex.

x	-4	-3	-2	-1	0	1	2
y	0	-5	-8	-9	-8	-5	0

c. The vertex is located at (-1 , -9), and it is a Max or Min?

d. The axis of symmetry is x = -1

e. The graph opens UP or DOWN because the a-value is positive.

f. The x-intercepts are at (-4 , 0) and (2 , 0).

g. The y-intercept is at (0 , -8)

5. Suppose a projectile thrusted into motion is modeled by the function $h(t) = -16t^2 + 128t + 320$.

a. What is the initial height of the object?

320 ft

b. What is the velocity?

128 ft/s

c. Suppose t is the time in seconds and h is height in feet, what is the height after 10 seconds?

$x = 10$

$y = h = 0$

d. What do the values in problem c tell us?

hits the ground.

6. It's the 4th of July! AH YEAH! You and some friends are planning to shoot off some mortar rounds. You are going to shoot them off of a 10 foot platform. The mortars shoot off at an upward velocity of 288 meters/second.

↓
+

a. Write the equation that models this situation.

$-16t^2 + 288t + 10$

↓
y=

b. Due to county policy, the mortar shots cannot exceed a height of 1,300 meters. Will the maximum height of your mortar rounds exceed the county limit? Show your work to prove it.

↓
vertex

vertex
(9, 1306)
↓ ↓
sec height

the mortors would exceed the height of 1300 ft.

#4. 2nd Window (tblset)

Δtbl = .5

tbl start = 0

everything else

Δtble = 1