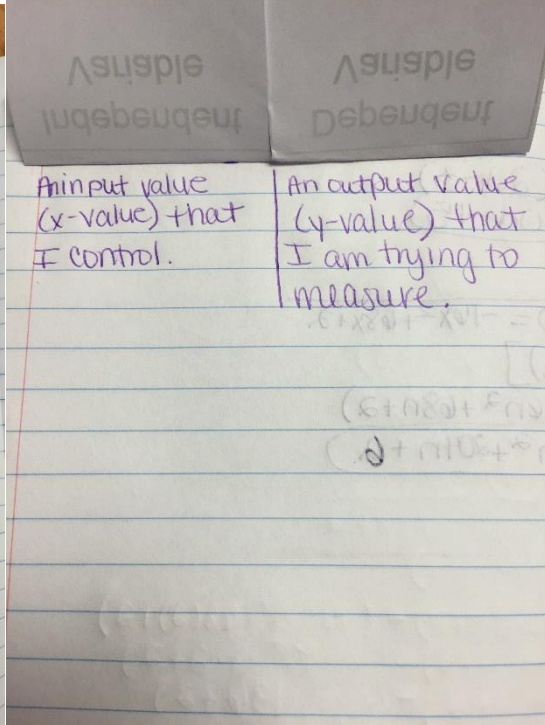
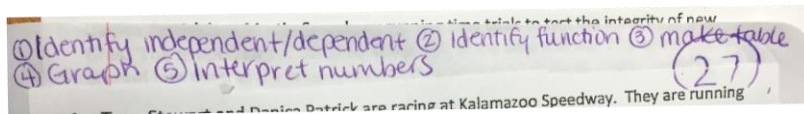


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interpret numbers (27)

1. Tony Stewart and Danica Patrick are racing at Kalamazoo Speedway. They are running their qualifying laps when they crash. Stewart's tire flies off of his car and bounces over the fence. What was the maximum height the tire reached?
(Use the function $h(t) = -3.52t^2 + 17.6t$)

④

① Independent - time
Dependent - height

② Quadratic $\rightarrow t^2$

③ t | $h(t)$

0	0	$-3.52(0)^2 + 17.6(0)$
1	14.08	$-3.52(1)^2 + 17.6(1)$
2	21.12	$-3.52(2)^2 + 17.6(2)$
3	21.12	$-3.52(3)^2 + 17.6(3)$
4	14.08	$-3.52(4)^2 + 17.6(4)$

⑤ $y = ax^2 + bx + c$ $t = \text{time}$
 $0 = c \rightarrow \text{start}$ $h(t) = \text{height at } t$
 $a = \text{negative}$ \downarrow time

At Martin Speedway, Danica's time for the quarter mile was 7.9 seconds at a top speed of 80 mph. Danica's crew chief wants to compare runs to see if she is losing time at any specific point in the run.

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① 2 3 4 5 time $a = \text{negative}$

At Martin Speedway, Danica's time for the quarter mile was 7.9 seconds at a top speed of 80 mph. Danica's crew chief wants to compare runs to see if she is losing time at any specific point in the run.
(Use the function $d(t) = 10.13t$)

① Independent - time
Dependent - distance

② Linear $\rightarrow y = mx + b$

③ t | $d(t)$

0	0	$10.13(0)$
1	10.13	$10.13(1)$
2	20.26	$10.13(2)$
3	30.39	$10.13(3)$
4	40.52	$10.13(4)$

⑤ $y = mx + b$ $t = \text{time}$
 $b = 0 \rightarrow \text{start}$ $d(t) = \text{distance at } t$
 $m = 10.13 = \text{rate}$ \downarrow time

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3. Danica Patrick is at Martin Speedway running time trials to test the integrity of new tires. The temperature of the tires at the start of the time trial was 75 degrees. One second into the trial the temperature of the tires was 90 degrees. Three seconds into the trial the temperature of the tires was 129.6 degrees. Precisely at 5.5 seconds into the run, what was the temperature of the tires? (29)

(Use the function $f(t) = 75(1.2)^t$)

④

① Independent - time
Dependent - temperature

② exponential $\rightarrow y = ab^x$

③

t	f(t)
0	75
1	90
2	108
3	129.6
4	155.52

⑤ $y = ab^x$
 $a = \text{start on y-axis} = 75$
 $b = \text{what we multiply by } 1.2$
 $t = \text{time}$
 $f(t) = \text{temperature at time } t$

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By the time you reach Ann Arbor you have traveled 125 miles and used 5 gallons of gas. How much gas will you have used up by the time you reach Comerica Park, 160 miles away? (29)

(Use the function $g(m) = -\frac{1}{25}m + 15$)

④

① Independent - miles
Dependent - gallons left

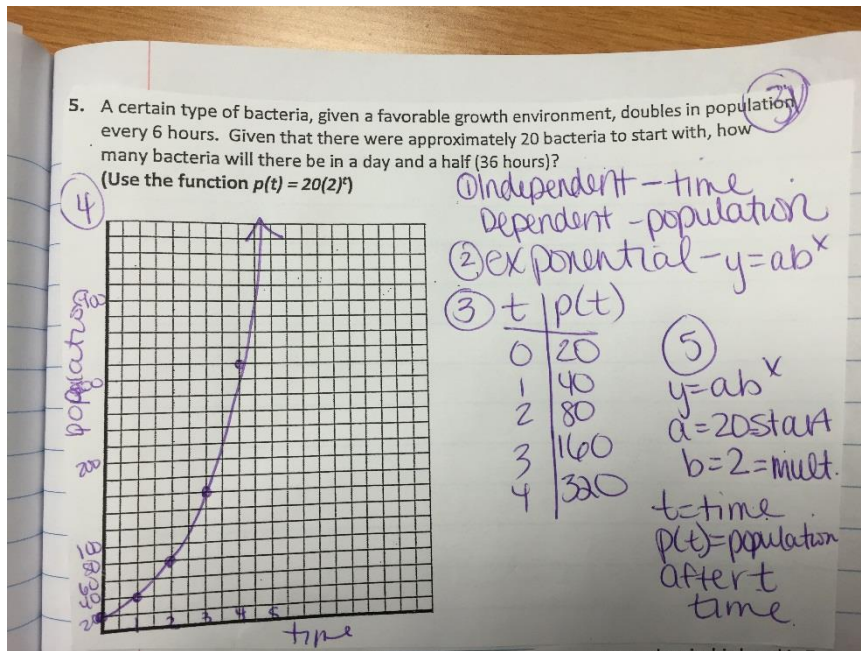
② linear $\rightarrow y = mx + b$

③

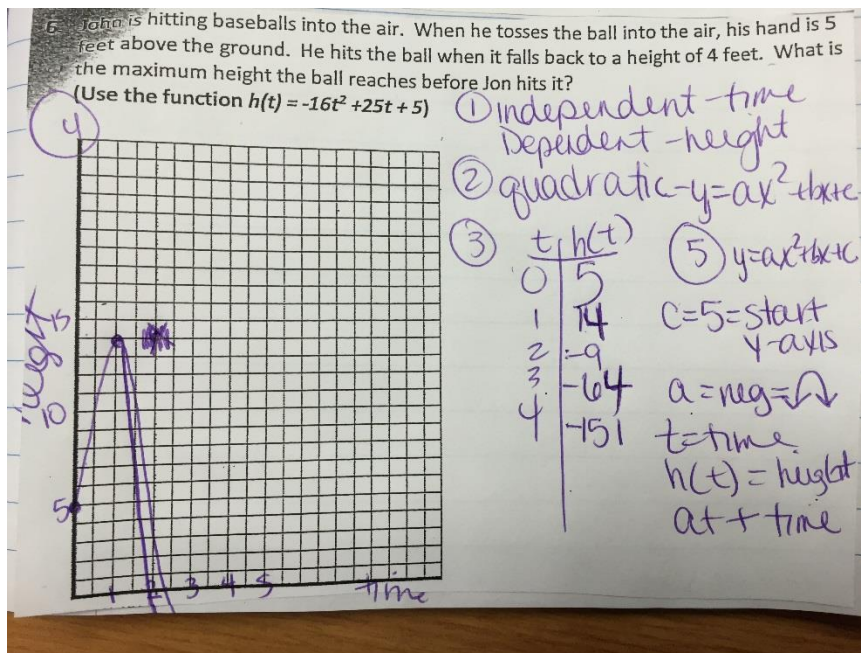
m	g(m)
0	15
1	14.96
2	14.92
3	14.88
4	14.84

⑤ $y = mx + b$
 $15 = \text{start}$
 $-\frac{1}{25} = \text{rate}$
 $m = \text{miles}$
 $g(m) = \text{gallons left after } m \text{ miles}$

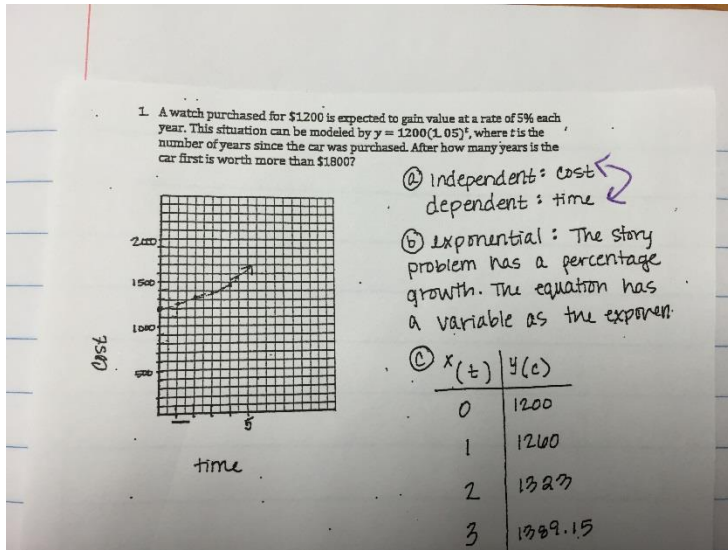
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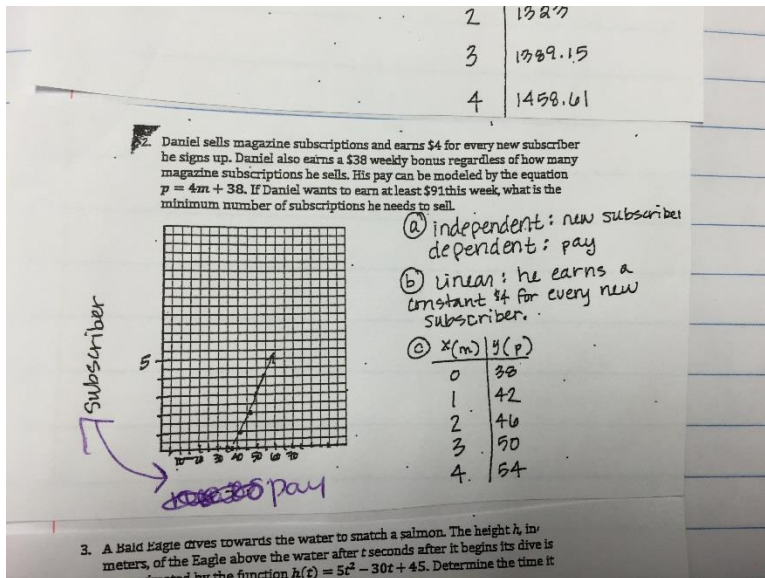
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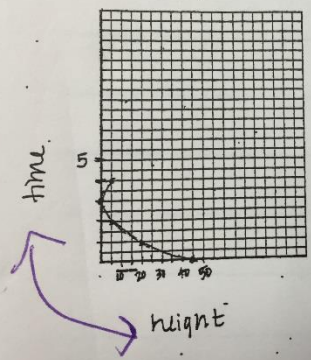


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3. A Bald Eagle dives towards the water to snatch a salmon. The height h , in meters, of the Eagle above the water after t seconds after it begins its dive is approximated by the function $h(t) = 5t^2 - 30t + 45$. Determine the time it takes for the Bald Eagle to reach a height of 20 meters.



- Ⓐ independent: time
dependent: height
- Ⓑ quadratic: The dive of the eagle makes a U shape and there is a t^2 in the equation.

Ⓒ

$x(h)$	$y(t)$
45	0
20	1
5	2
0	3
5	4