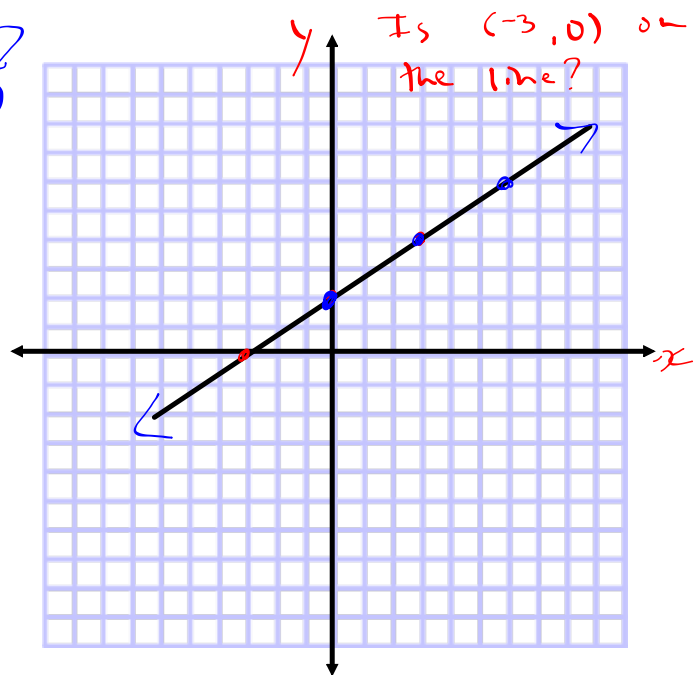


$$m = \frac{\text{rise}}{\text{run}} \quad y = mx + b \quad \begin{array}{l} \text{y-int} \\ (0, 2) \end{array}$$

graph $\rightarrow y = \frac{2}{3}x + 2$

construct table of values

x	y
0	$\frac{2}{3}(0) + 2 = 2$
3	$\frac{2}{3}(3) + 2 = 4$



$$y = \frac{2}{3}x + 2$$

$$0 = \frac{2}{3} \cdot \frac{(-3)}{1} + 2$$

$$0 = -2 + 2$$

$$0 = 0 \rightarrow \text{it makes a true statement!}$$

Is $(-3, 0)$ on the line?

Check by subbing into equation and see if the point satisfies the equation

$$y = \frac{2}{3}x + 2$$
$$6 = \frac{2}{3}x + 2$$

(x,) =

$$y = \frac{2}{3}x$$

$$x = \frac{y}{\frac{2}{3}} \times \frac{3}{2}$$

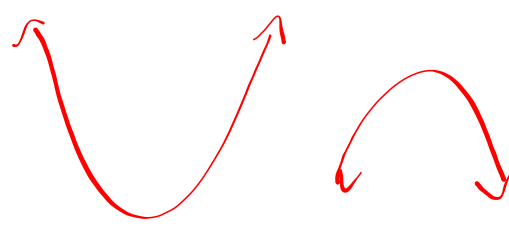
$$x = \frac{12}{2} \quad x = 6$$

(x, ^y6)

what's x?

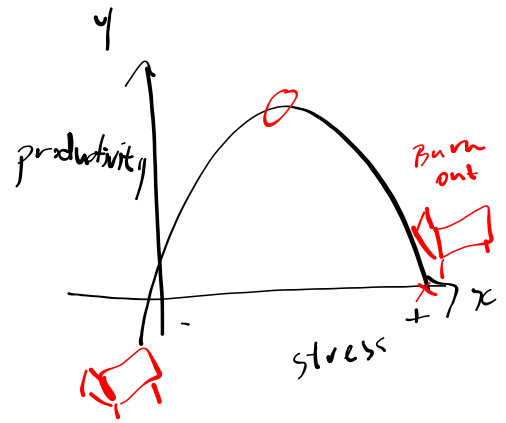
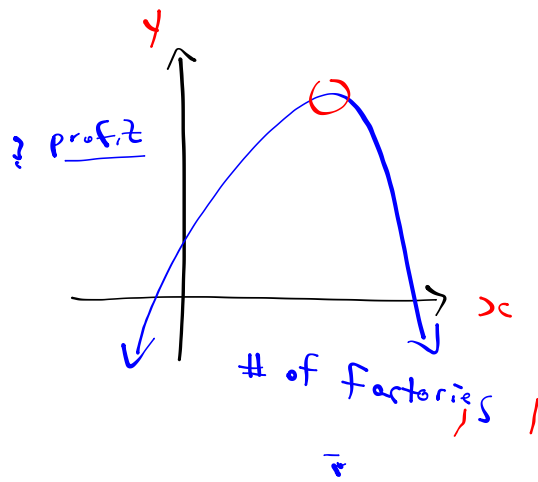
an equation tells
you the value of
a missing coordinate
in a point on the
line.

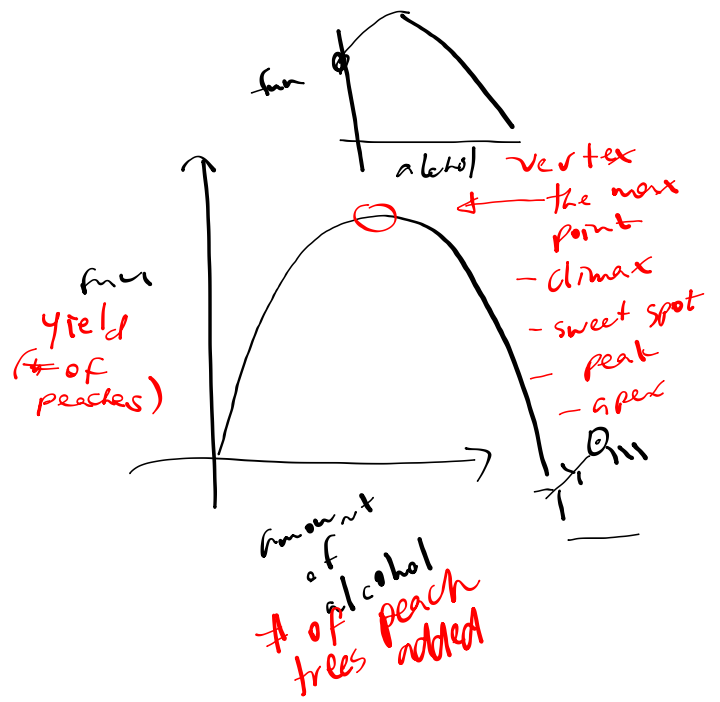
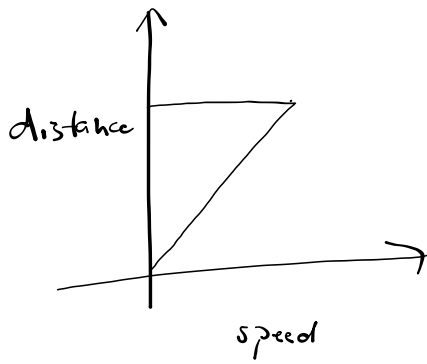
linear functions 1st degree
 $y = mx + b$
slope \rightarrow m
 \rightarrow b y-int
 \rightarrow

quadratic function 2nd degree
 $y = ax^2 + bx + c$


a graph tells a story!

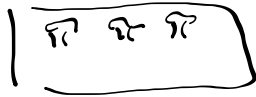
Label
your
axis





Unit 1: Determining the maximum (Vertex)
 (Word Questions solved in a chart)
 TIP → show your calculations!!

ex
 pg. 1.1



30 trees
 400 peaches each
 each additional tree
 - 10 peaches
 • how many more
 trees should the
 farmer add

$y = a \cdot x^2 + b \cdot x + c$

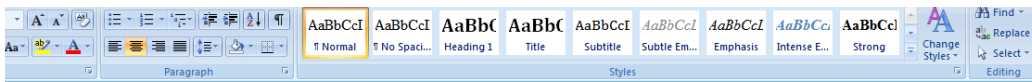


max →

# of trees added	total # of trees	yield per tree	total yield of orchard
0	30	400	$30 \times 400 = 12\,000$
1	$30 + 1 = 31$	$400 - 10 = 390$	$(30 + 1)(400 - 10) = 12\,090$
2	$30 + 2 = 32$	$400 - 10(2) = 380$	$(30 + 2)(400 - 10(2)) = 12\,160$
3	$30 + 3 = 33$	$400 - 10(3) = 370$	$(30 + 3)(400 - 10(3)) = 12\,210$
4	$30 + 4 = 34$	$400 - 10(4) = 360$	$(30 + 4)(400 - 10(4)) = 12\,240$
5	$30 + 5 = 35$	$400 - 10(5) = 350$	$(30 + 5)(400 - 10(5)) = 12\,250$
6	$30 + 6 = 36$	$400 - 10(6) = 340$	$(30 + 6)(400 - 10(6)) = 12\,240$

∴ the friendly farmer should add no more than 5 trees to maximize his peach yield!

Do ex. 1.1 on p. 1.6



/10

Every month, Irene sells 6 dozen roses that she grows in her garden for \$20 per dozen. For every additional dozen roses she grows, she can reduce her price by \$2 per dozen. How many dozen roses should she grow every month in order to maximize her total sales? Complete the following table and write the equation that can be used to solve the problem. Your equation should be in the form $y = ax^2 + bx + c$

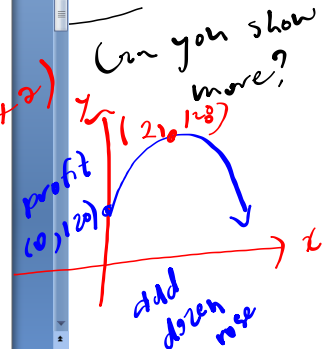
Number of additional dozens of roses	Total number of dozens of roses	Selling Price (\$)	Total Sales (\$)
x			y
0	6	20	$6 \times 20 = 120$
1	$6 + 1 = 7$	$20 - 2 = 18$	$7 \times 18 = 126$
2	$6 + 2 = 8$	$20 - 2 \cdot 2 = 16$	$= 128$
3	$6 + 3 = 9$	$20 - 2 \cdot 3 = 14$	$= 126$

x

Write the equation in the form $ax^2 + bx + c$ which illustrates this situation.

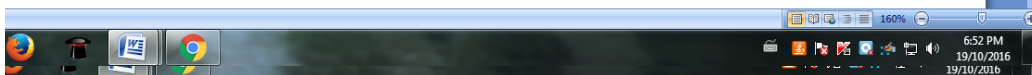
She should add 2 more dozen roses

$20 - (2 + 2 + 2)$
 $20 - 2 \cdot 3$



Careful of questions that don't show all the calculations

Can you show more?



Unit 2: Determining the 2nd degree equation involving a max by filling out the 'x' row

Tip → Show all the work

ex pg. 1

30 trees
400 peaches each
each additional tree - 10 peaches
• how many more trees should the farmer add

$y = ax^2 + bx + c$

x	# of trees added	total # of trees	yield per tree	total yield of orchard
0	0	30	400	$30 \times 400 = 12\ 000$
1	30+1 = 31	30+1 = 31	$400-10 = 390$	$(30+1)(400-10) = 12\ 090$
2	30+2 = 32	30+2 = 32	$400-10(2) = 380$	$(30+2)(400-10(2)) = 12\ 160$
3	30+3 = 33	30+3 = 33	$400-10(3) = 370$	$(30+3)(400-10(3)) = 12\ 210$
4	30+4 = 34	30+4 = 34	$400-10(4) = 360$	$(30+4)(400-10(4)) = 12\ 240$
5	30+5 = 35	30+5 = 35	$400-10(5) = 350$	$(30+5)(400-10(5)) = 12\ 250$
6	30+6 = 36	30+6 = 36	$400-10(6) = 340$	$(30+6)(400-10(6)) = 12\ 240$
7	30+7 = 37	30+7 = 37	$400-10(7) = 330$	$(30+7)(400-10(7)) = 12\ 210$
⋮				
x	$30+x$	$30+x$	$400-10x$	$(30+x)(400-10x) = y$

max →

⊛ Substitute x for what varies in the columns

⊛ The last column is what y equals

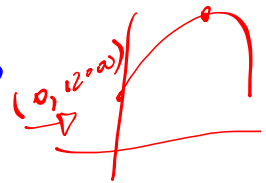
$$y = ax^2 + bx + c$$

$$y = (30+x)(400-10x)$$

$$y = 12\ 000 - 300x + 400x - 10x^2$$

$$y = 12\ 000 + 100x - 10x^2$$

$$y = -10x^2 + 100x + 12\ 000$$



$y = \text{int}$

12 210

if $x = 8$, what's y

$x = 7$

$$y = -10(7)^2 + 100(7) + 12\ 000$$

Do #4 on 2.9

- Find equation
- Sketch a graph
(label axes)
- find y when
 $x = 6$