

# Quadratics

opens  
up

vertex

vertex

opens  
down

$$y = -4x^2 + 3x + 1$$

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## Unit 3: Lesson 2 - REGRESSION USING QUADRATIC RELATIONS

**Vertex Form**       $y = a(x - h)^2 + k$

E.g. What is the vertex of each of the following quadratic relations?  
What is the direction of opening of each?

a)  $y = \underline{4}(x - 2)^2 + 3$  *other*

VERTEX:  $(2, 3)$  *other*

DIRECTION OF OPENING: *up*

b)  $y = -3(x + 7)^2 - 2$

VERTEX:  $(-7, -2)$

DIRECTION OF OPENING: *down*

c)  $y = -(x + 3)^2$

REWRITTEN EQUATION:  
 $y = -(x + 3)^2 + 0$

VERTEX:  $(-3, 0)$

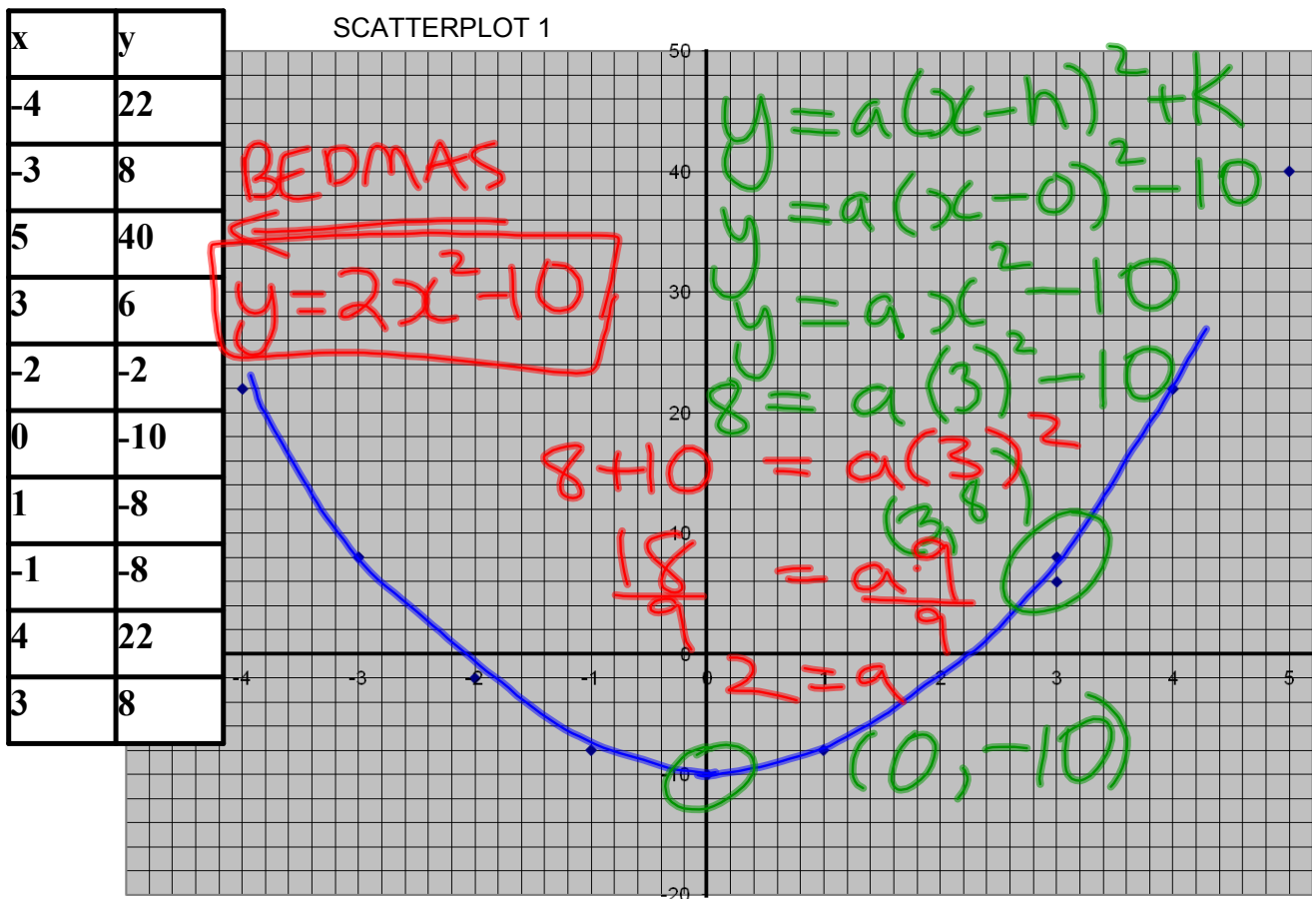
DIRECTION OF OPENING: *down*

d)  $y = 4x^2 + 3$

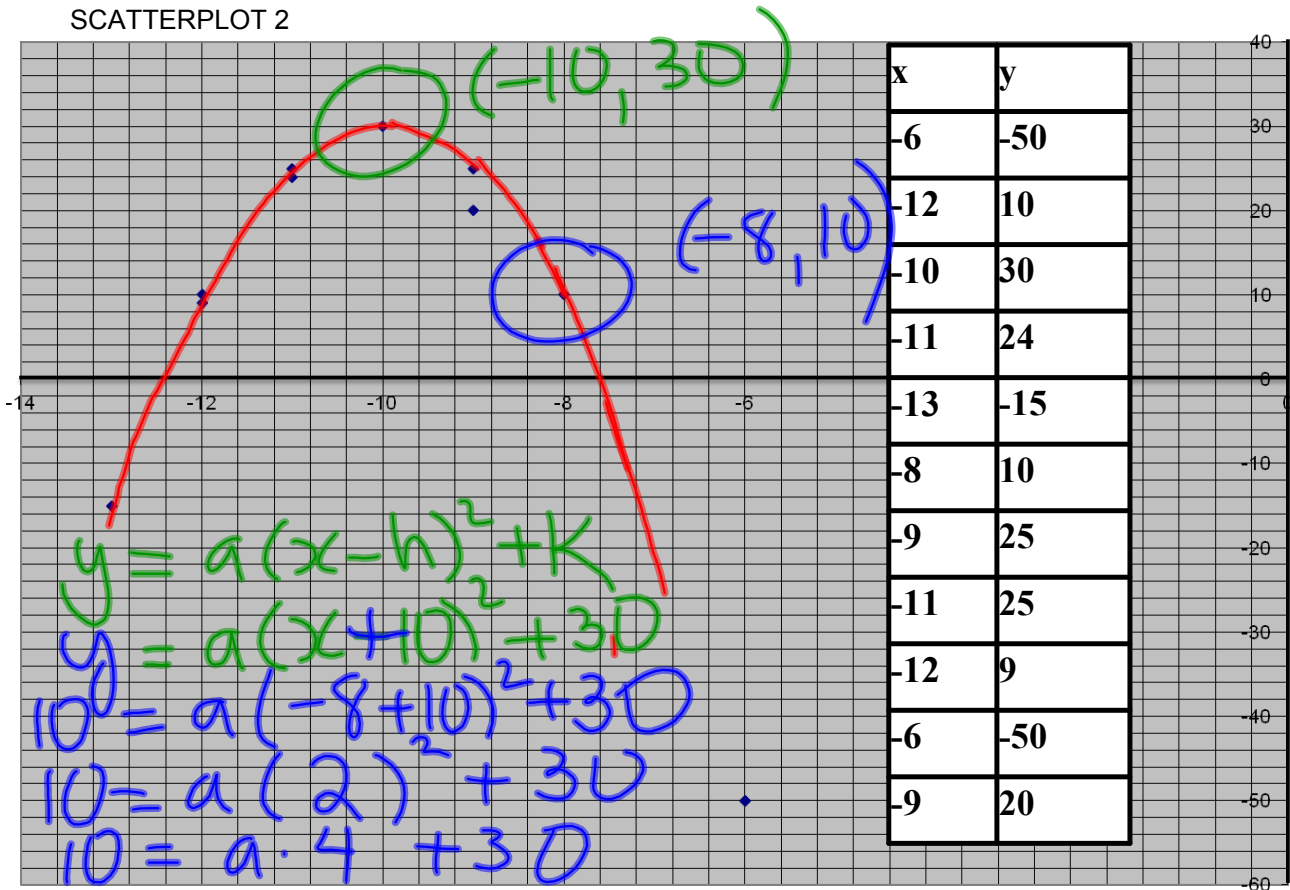
REWRITTEN EQUATION:  
 $y = 4(x + 0)^2 + 3$

VERTEX:  $(0, 3)$

DIRECTION OF OPENING: *up*



## SCATTERPLOT 2



$$10 - 30 = a \cdot 4$$

$$\frac{-20}{4} = \frac{a \cdot 4}{4}$$

$$-5 = a$$

$$y = -5(x+10)^2 + 30$$