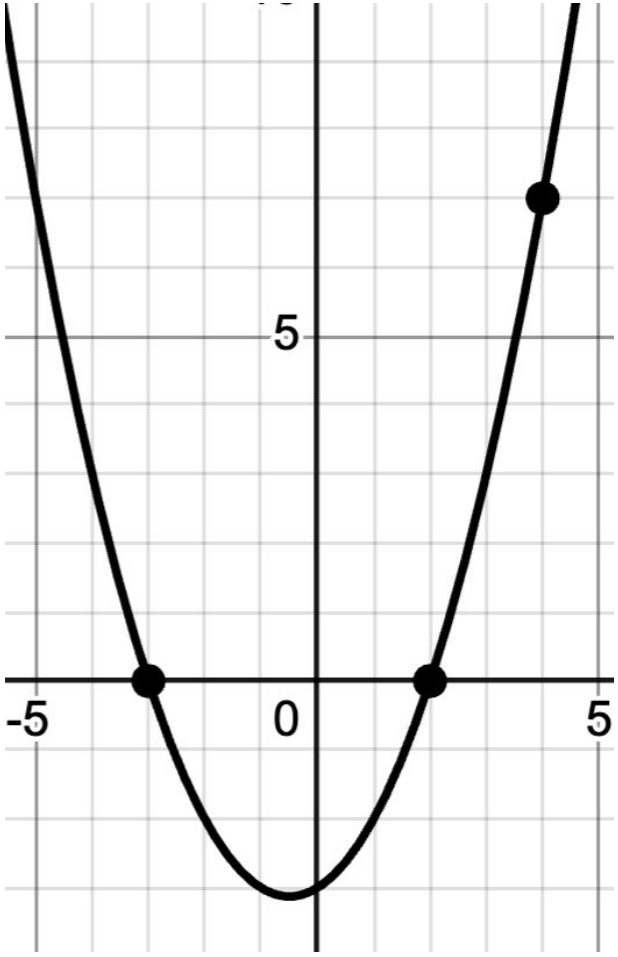
Write a function in <u>standard form</u> that represents the parabola.

#1



Given the graph, find Factored Form

Factored Form…

$f(x)=a(x-x_1)(x-x_2)$

$7=a(4- -3)(4-2)$

$7=a(7)(2)$

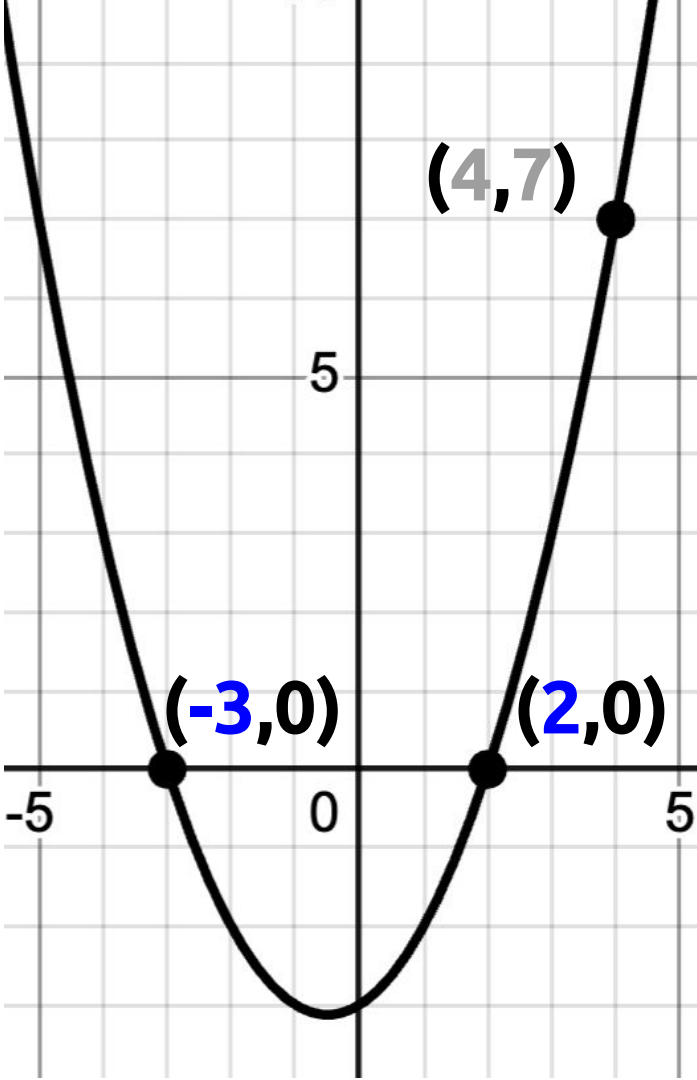
$7=a(14)$

$7=14a$

$\frac{1}{2}=a$

Factored Form: $f(x)=\frac{1}{2}(x+3)(x-2)$

…



Convert Factored form to Standard Form

Factored Form: $f(x)=\frac{1}{2}(x+3)(x-2)$

$f(x)=\frac{1}{2}(x+3)(x-2)$

$f(x)=\frac{1}{2}(x+3)(x-2)$

$f(x)=\frac{1}{2}(x^2+1x-6)$

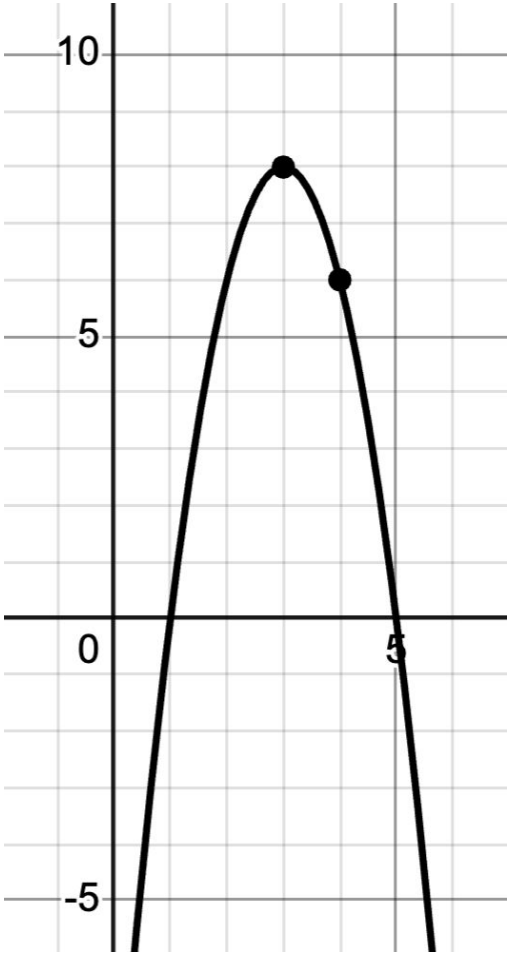
$f(x)=0.5x^2+0.5x-3$

	x	$+3$
x	x^2	$+3x$
-2	$-2x$	-6

Standard Form: $f(x)=0.5x^2+0.5x-3$

Write a function in <u>standard form</u> that represents the parabola.

#2



Given the Graph, find Vertex Form

Vertex Form…

$f(x)=a(x-h)^2+k$

$6=a(4-3)^2+8$

$6=a(1)^2+8$

$6=a(1)+8$

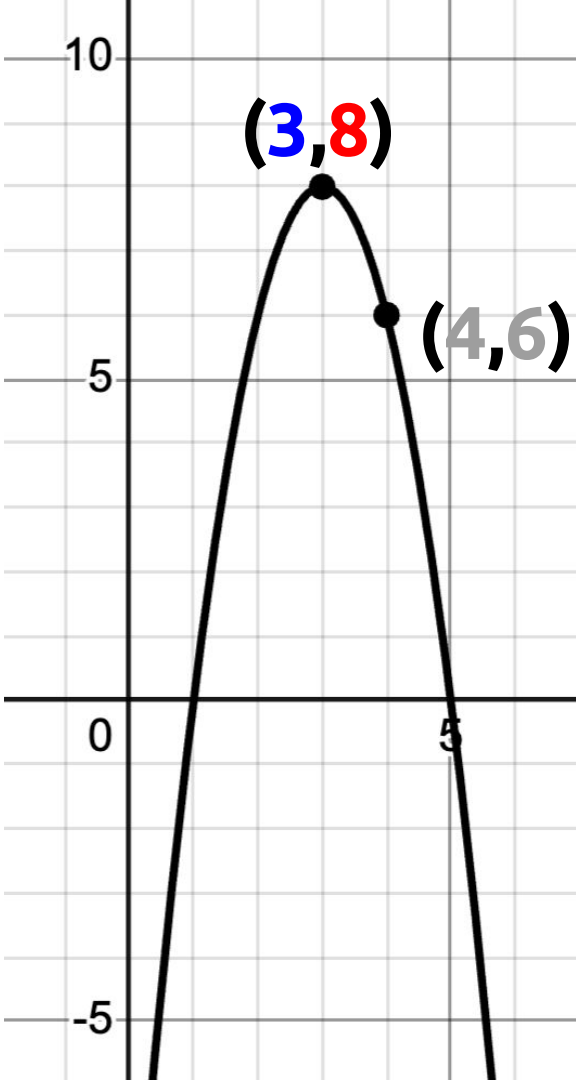
$6=1a+8$

$-2=1a$

$-2=a$

Vertex Form: $f(x)=-2(x-3)^2+8$

…



Convert Vertex Form to Standard Form

Vertex Form: $f(x)=-2(x-3)^2+8$

$f(x)=-2(x-3)(x-3)+8$

$f(x)=-2(x-3)(x-3)+8$

$f(x)=-2(x^2-6x+9)+8$

$f(x)=-2x^2+12x-18+8$

$f(x)=-2x^2+12x-10$

	x	-3
x	x^2	-3x
-3	-3x	+9

Standard Form: $f(x)=-2x^2+12x-10$

Turn the Standard Form function in to Vertex Form.

#3

$$f(x)=2x^2+12x+14$$

Standard Form: $2x^2+12x+14$

$a=2$ $b=12$ $c=14$

$$x=\frac{-b}{2a}$$

$$x=\frac{-(12)}{2(2)}$$

$$x=-3$$

$f(x)=2x^2+12x+14$

$f(-3)=2(-3)^2+12(-3)+14$

$f(-3)=-4$

Vertex

$(-3,-4)$

(h,k)

Vertex Form:

$f(x)=a(x-h)^2+k$

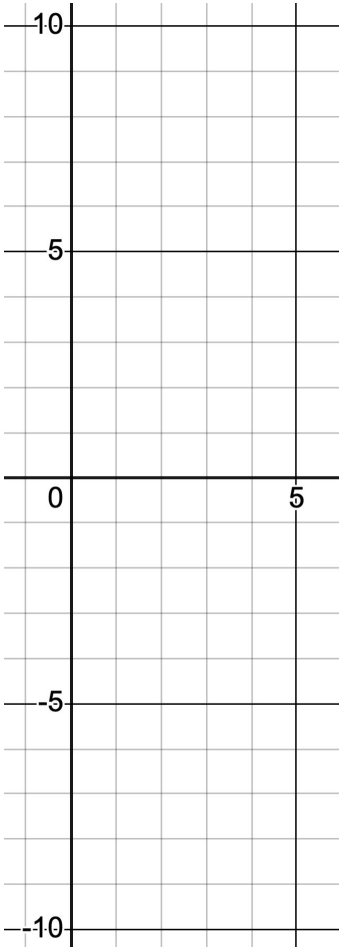
$f(x)=2(x--3)^2+-4$

$$f(x)=2(x+3)^2-4$$

Create a graph and label the vertex and one other point.

#4

$$f(x)=-2(x-3)^2+6$$



Vertex Form: $f(x)=-2(x-3)^2+6$

Vertex Form: $f(x)= a(x-h)^2+k$

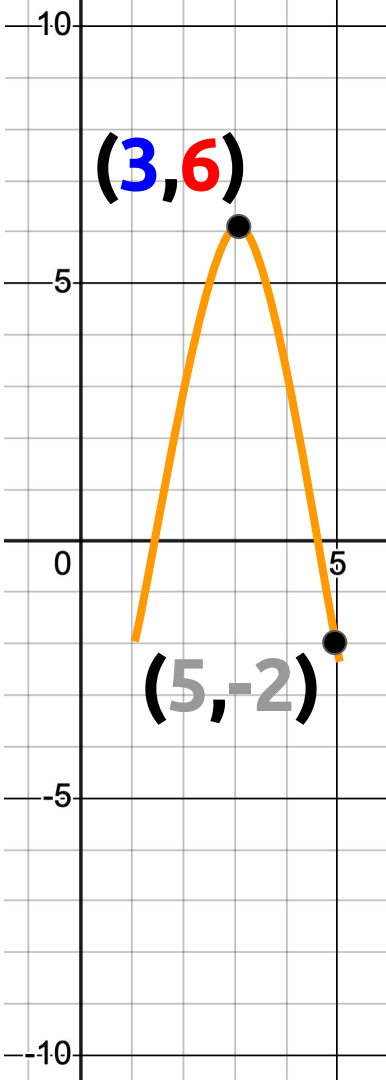
- Get the vertex (h,k) and plot the point.
- Pick any x value near 3 and plug it in.

  I will choose 5.

  $f(5)=-2(5-3)^2+6$

  $f(5)=-2$

  Plot the point (5,-2)
- The a is negative so the parabola opens down.



THE END

Given the graph, find the Vertex Form.

Vertex Form…

$f(x)=a(x-h)^2+k$

$3=a(2-4)^2+-5$

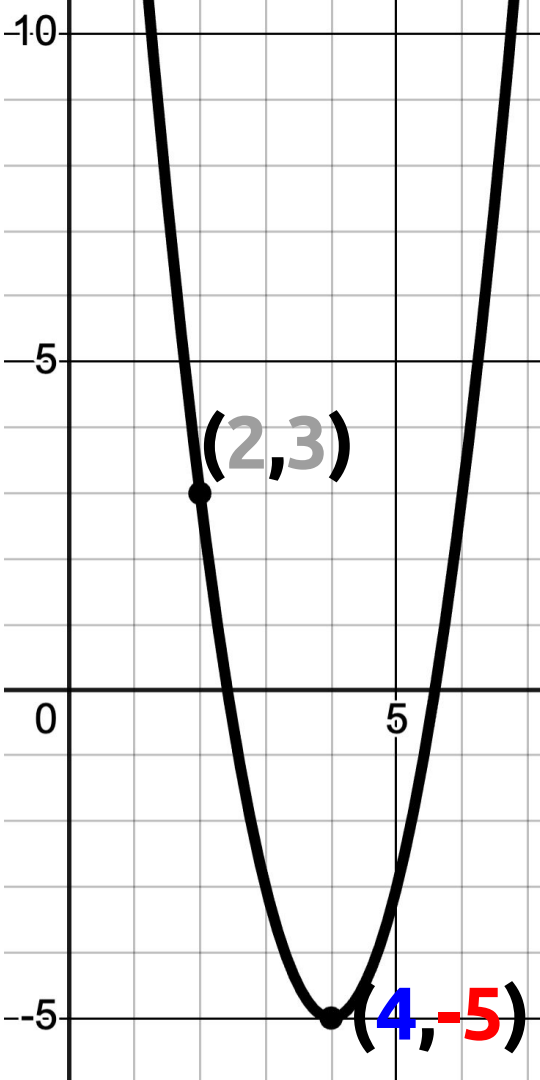
$3=a(-2)^2-5$

$3=a(4)-5$

$8=a(4)$

$2=a$

Vertex Form: $f(x)=2(x-4)^2-5$



Convert Vertex Form to Standard Form.

Vertex Form: $f(x)=2(x-4)^2-5$

$f(x)=2(x-4)^2-5$

$f(x)=2(x-4)(x-4)-5$

$f(x)=2(x^2-8x+16)-5$

$f(x)=2x^2-16x+32-5$

$f(x)=2x^2-16x+27$

	x	-4
x	x^2	$-4x$
-4	$-4x$	$+16$

Standard Form: $f(x)=2x^2-16x+27$