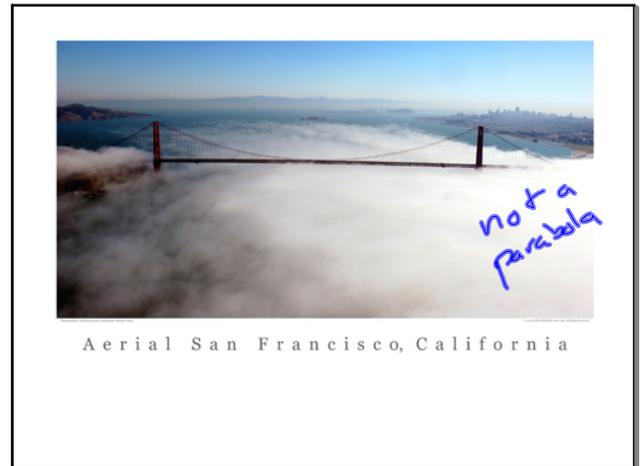




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2-1 Quadratic Functions

Quadratic function - $y = ax^2 + bx + c$

Standard form - $y = a(x-h)^2 + k$

Axis of symmetry - $x = h$

Vertex - (h, k)

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Ex 1 Identify the vertex, x-intercepts, y-intercept, and sketch the graph of $f(x) = (x-5)^2 - 4$

V: $(5, -4)$

x-ints: $(7, 0)$
 $(3, 0)$

0 = $(x-5)^2 - 4$
 $\sqrt{4} = \sqrt{(x-5)^2}$
 $2 = x-5$ $-2 = x-5$
 $7 = x$ $3 = x$

y-int: $(0, 21)$
 $y = (0-5)^2 - 4$
 $y = 21$

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Ex 2 Identify the vertex, x-intercepts, y-intercept, and sketch the graph of $f(x) = x^2 - 4x + 3$ by completing the square.

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

V: $(2, -1)$

x-ints: $(1, 0)$
 $(3, 0)$

y-int: $(0, 3)$

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Ex 3 Identify the vertex, x-intercepts, y-intercept, and sketch the graph of $f(x) = -x^2 - 4x + 21$ by completing the square.

$$y = -x^2 - 4x + 21$$

$$y = -(x^2 + 4x + 4) + 21 + 4$$

$$y = -(x+2)^2 + 25$$

V: $(-2, 25)$ y-int: $(0, 21)$

x-int: $(3, 0)$ $(-7, 0)$

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$$y = -(x+2)^2 + 25$$

$$0 = -(x+2)^2 + 25$$

$$\sqrt{+25} = \sqrt{(x+2)^2}$$

$$5 = x+2 \quad -5 = x+2$$

$$3 = x \quad -7 = x$$

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Ex. 4 Find the equation of the parabola with vertex $(-2, 5)$ through the point $(0, 4)$.

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

$$4 = a(0 - (-2))^2 + 5$$

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

$$4 = a \cdot 4 + 5$$

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Homework
p.99
#1-33 odds
39-44 all

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