1. If $ax + bx = 36$, what is the value of x when $a + b = 12$?

$x(a+b)=36$

A. 3 B. 6 C. 12 D. 24 E. 48

2. If $(x-3)(x+3) = a$, then $(2x-6)(x+3) = ?$

$2(x-3)(x+3)$

A. 2a B. 3a C. 4a D. 6a E. 9a

3. If $a = x - 3$, what does $x^2 - 9$ equal in terms of a?

$(x-3)(x+3)$ $a(a+6)$

$a+3=x$

A. $(a-3)^2$ B. $(a+3)^2$ C. $a(a-3)$ D. $a(a+3)$ E. $a(a+6)$

4. Emma solved the equation $x^2 + 2x - 8 = 0$ by completing the square. Is her solution correct or incorrect? Explain your reasoning.

$x^2 + 2x + \underline{1} = 8 + \underline{1}$

$(x+1)^2 = 9$

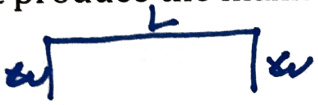
$x + 1 = 3$

$x = 2$

Forgot ± 9!

INCORRECT.

5. You want to fence your backyard using 100 m of fencing. One length of the backyard does not need fencing because that's where your house is. Find dimensions that produce the maximum amount of area for your backyard.



$L + 2w = 100$

$L = 100 - 2w$

$A = L \cdot w$

$A = w(100-2w)$

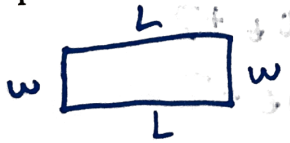
$A = 100w - 2w^2$

$A = -2w^2 + 100w$

$\frac{-100}{2(-2)} = 25$

(25 × 50)

6. A rancher has 80 yards of fencing to build a rectangular pen. Let w be the width of the pen. Write an equation giving the area of the pen. Find the dimensions of the pen when the area is 400 square yards.



$2L + 2w = 80$

$L = \frac{80-2w}{2}$

$L = 40 - w$

$400 = (40-w)(w)$

$= 40w - w^2 - 400$

$400 = 40w - w^2$

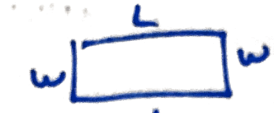
$0 = -w^2 + 40w - 400$

$0 = w^2 - 40w + 400$

$w = 20$

20 × 20 a square is a rectangle.

7. You have a 500-foot roll of fencing and a large field. You want to construct a rectangular playground area, fenced in on all sides. What are the dimensions of the largest such yard? What is the largest area?



$500 = 2L + 2w$ → $L = \frac{500 - 2w}{2}$

$L = 250 - w$

$A = L \cdot w$

$A = (250 - w)(w)$

$A = -w^2 + 250w$ → Find the maximum

$w = 125$

$125 \text{ ft} \times 125 \text{ ft}$

A square is a rectangle.

15625 ft²

8. The senior class at Bay High School buys jerseys to wear to the football games. The cost of the jerseys can be modeled by the equation $C(x) = 0.1x^2 + 2.4x + 25$ where $C(x)$ is the amount it costs to buy x jerseys. How many jerseys can they purchase for $500?

$500 = 0.1x^2 + 2.4x + 25$

$0 = 0.1x^2 + 2.4x - 475$

Graph this & find solutions

≈ 57 jerseys

9. The height h in feet of an object shot straight up with initial velocity v in feet per second is given by $h = -16t^2 + vt + c$, where c is the initial height of the object above the ground. The ringer on a carnival strength test is 2 feet off the ground and is shot upward with an initial velocity of 30 feet per second. Will it reach a height of 20 feet? Use the discriminant to explain your answer (the discriminant will tell us how many solutions there are).

$h = -16t^2 + 30t + 2$

$20 = -16t^2 + 30t + 2$

$0 = -16t^2 + 30t - 18$

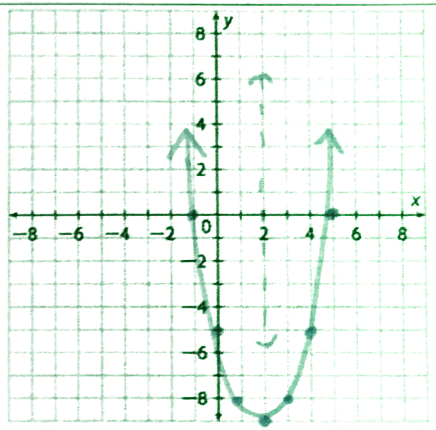
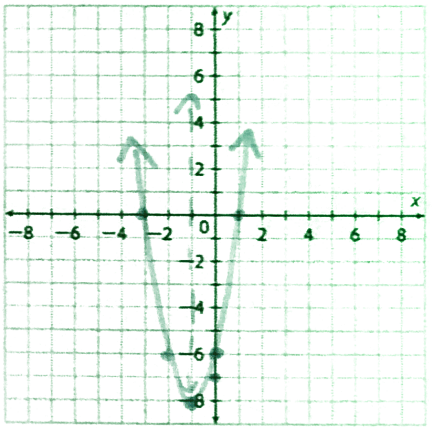
$(30)^2 - 4(-16)(-18)$

-252

No

Key

Graphing Review

Vertex Form	Intercept Form	Standard Form	Graph
$f(x) = x^2 - 4x + 4 - 5 + 4$ $f(x) = (x-2)^2 - 9$	$f(x) = (x-5)(x+1)$	$f(x) = x^2 - 4x - 5$	
$f(x) = 2[x^2 + 2x + 1] - 6$ $f(x) = 2(x+1)^2 - 8$	-2 *remember to factor out the GCF first $f(x) = 2(x^2 + 2x - 3)$ $f(x) = 2(x+3)(x-1)$	$f(x) = 2x^2 + 4x - 6$	

Use any method to solve. Explain why you chose the method that you chose.

1. $x^2 + 8x = -15$

$x^2 + 8x + 15 = 0$
$(x+5)(x+3) = 0$
$x = -3$ or $x = -5$

2. $3x^2 - 16x - 7 = 5$

$3x^2 - 16x - 12 = 0$
$\frac{-(-16) \pm \sqrt{(-16)^2 - 4(3)(-12)}}{2(3)}$
$\frac{16 \pm \sqrt{256 + 144}}{6}$
$\frac{16 \pm \sqrt{400}}{6}$
$\frac{16 \pm 20}{6}$ → $\frac{36}{6} = 6$, $\frac{-4}{6} = -\frac{2}{3}$

3. $x^2 + 8x = 28$

$x^2 + 8x - 28 = 0$
$x^2 + 8x + 16 = 28 + 16$
$(x+4)^2 = 44$
$x = -4 \pm \sqrt{44}$
$x = -4 \pm 2\sqrt{11}$

4. $x^2 - 8 = -2x$

$x^2 + 2x - 8 = 0$
$(x+4)(x-2) = 0$
$x = 2$ or $x = -4$

5. $4x^2 + 8x + 7 = 4$

$4x^2 + 8x + 3 = 0$
$4x^2 + 6x + 2x + 3 = 0$
$2x(2x+3) + 1(2x+3) = 0$
$(2x+1)(2x+3) = 0$
$x = -3/2$ $x = -1/2$

6. $2x^2 - 7x - 13 = -10$

$2x^2 - 7x - 3 = 0$
$\frac{-(-7) \pm \sqrt{49 - 4(2)(-3)}}{2(2)}$
$x = \frac{7 \pm \sqrt{73}}{4}$

7. Suppose $h(t) = -5t^2 + 10t + 3$ is the height of a diver above the water (in meters), t seconds after the diver leaves the springboard.

a. How high above the water is the springboard? Explain how you know. 3 ft

b. When does the diver hit the water? $0 = -5t^2 + 10t + 3$ 2.265

$\frac{-10 \pm \sqrt{100 - 4(-5)(3)}}{2(-5)}$
$\frac{-10 \pm \sqrt{160}}{-10}$

c. At what time on the diver's descent toward the water is the diver again at the same height as the springboard? 2 seconds

$3 = -5t^2 + 10t + 3$
$0 = -5t^2 + 10t$
$0 = -5t(t-2)$

d. When does the diver reach the peak of the dive? $\frac{-10}{2(-5)} =$ 1 second