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45

$f(x) = -2x^2 + 12x + 0$

$f(x) = ax^2 + bx + c$

$a = -2 \quad b = 12 \quad c = 0$

$h = \frac{-b}{2a} \qquad k = c - \frac{b^2}{4a}$

$h = \frac{-12}{2(-2)} \qquad k = 0 - \frac{12^2}{4(-2)}$

$= \frac{-12}{-4} \qquad = 0 + \frac{12^2}{4(2)}$

$h = 3 \qquad = \frac{144}{8}$

$h = 3 \qquad k = 18$

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

$a = -2$

$b = 12$

$c = 0$

$h = 3$

$k = 18$

denom of a : $\underline{1}$

| x | y |
|---|---|
| 1 | 10 |
| 2 | 16 |
| 3 | 18 |
| 4 | 16 |
| 5 | 10 |

← vertex

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

If $x = 1$, then

$y = -2(1)^2 + 12(1)$

$= -2 + 12$

$= 10$

If $x = 2$, then

$y = -2(2)^2 + 12(2)$

$= -8 + 24$

$= 16$



livescribe

(45) $f(x) = -2x^2 + 12x + 0$

$f(x) = ax^2 + bx + c$

$a = -2 \quad b = 12 \quad c = 0$

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$h = 3 \qquad = \frac{144}{8}$

$\downarrow \qquad k = 18$

$h = 3$

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

$a = -2$

$b = 12$

$c = 0$

$h = 3$

$k = 18$

denom of a: 1

| x | y |
|---|---|
| 1 | 10 |
| 2 | 16 |
| 3 | 18 ← Vertex |
| 4 | 16 |
| 5 | 10 |

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

If $x = 1$, then

$y = -2(1)^2 + 12(1)$

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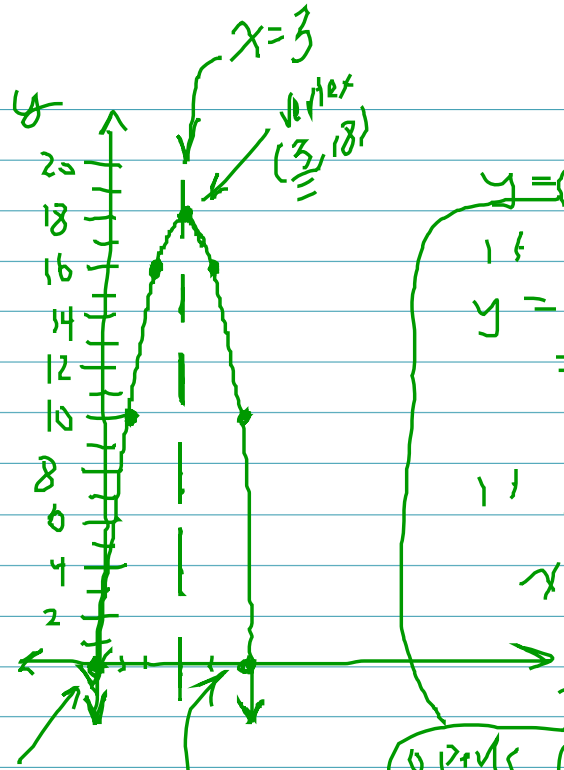
$= 16$

| x | y |
|---|---|
| 0 | 0 |
| 1 | 10 |
| 2 | 16 |
| 3 | 18 |
| 4 | 16 |
| 5 | 10 |
| 6 | 0 |




$y = -2x^2 + 12x$

If $x = 0$, then

$y = -2(0)^2 + 12(0)$

$= 0 + 0$

$= 0$

If $y = 6$, then

$x = -2(6)^2 + 12(6)$

$= -72 + 72$

$x = 0$

opens down

$a = -16 \quad b = 32 \quad c = 0$

(55) $h(t) = -16t^2 + 32t$

(a) The equation has a maximum what part of the equation proved that?

$a = -16$ (opens down) → max

(b) Max Height: (Find Vertex)

$(h, k)$

$\left(\frac{-b}{2a}, c - \frac{b^2}{4a}\right)$

$\left(\frac{-32}{2(-16)}, 0 - \frac{32^2}{4(-16)}\right)$

$\left(\frac{-32}{-32}, 0 + \frac{32^2}{4(16)}\right)$

$(1, 16)$

$(x, y)$

$(t, h)$

$h(t) = -16t^2 + 32t$

$y \quad x \quad x$

16 feet

After 1 second in the air, the max height of 16 feet is reached.

(c) How long? 1 sec

§8.5 $y = a(x-h)^2 + k$ vertex form

§8.6 $y = ax^2 + bx + c$ standard form

$h = \frac{-b}{2a}$ $k = c - \frac{b^2}{4a}$

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§4.1 Lect Notes p.55

Solving a system by graphing.

$$\begin{cases} x + y = -6 & [1] \\ x - 4y = 4 & [2] \end{cases}$$

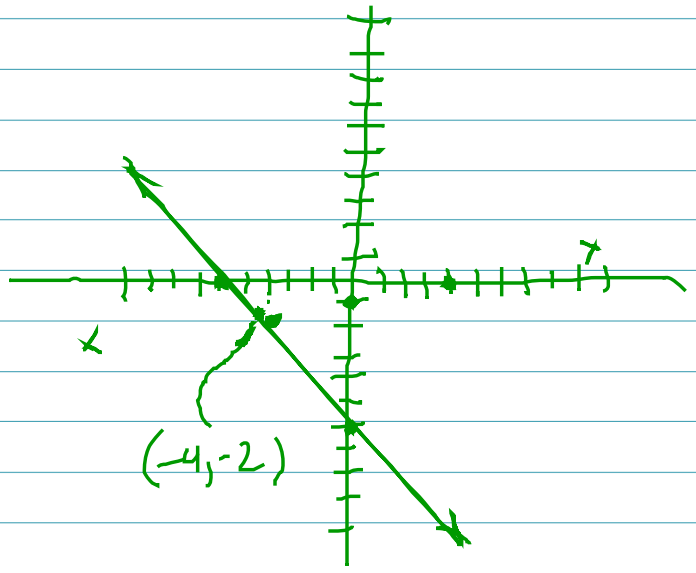
(use intercepts method)

[1] $x + y = -6$

x-int ($y=0$): $x + 0 = -6$, $x = -6$, $(-6, 0)$

y-int ($x=0$): $0 + y = 6$, $y = -6$, $(0, -6)$

plot both & connect




Camron
Oksana
Debbie

$(-4, -2)$

??

[2] $x - 4y = 4$

x-int ($y=0$): $x - 4(0) = 4$, $x = 4$, $(4, 0)$

y-int ($x=0$): $0 - 4y = 4$, $\frac{-4y}{-4} = \frac{4}{-4}$, $y = -1$, $(0, -1)$

4 1.3 Is $(-4, 2)$ a solution of the system?

$$\begin{cases} x + y = -6 & (1) \\ x - 4y = 4 & (2) \end{cases}$$

$x = -4 \quad y = 2$

(1) $x + y = -6$

$-4 + (2) = -6$

$-6 = -6$ ✓

(2) $x - 4y = 4$

$-4 - 4(2) = 4$

$-4 + 4(2) = 4$

$-4 + 8 = 4$

$4 = 4$ ✓

$(-4, 2)$ is a solution

# Substitution and Elimination

4.1.21

Solve by substitution.

$$\begin{cases} \frac{x}{4} + y = -\frac{19}{4} & [1] \\ -2x + 14y = -116 & [2] \end{cases}$$

Hint: Clear the fractions first, then solve it for x.

[1] $4\left(\frac{x}{4} + y\right) = \left(-\frac{19}{4}\right)4$ LCD = 4

$$\frac{4}{1}\cdot\frac{x}{4} + 4y = \frac{-19}{4}\cdot\frac{4}{1}$$

$$\begin{cases} x + 4y = -19 & [1] \\ -2x + 14y = -116 & [2] \end{cases}$$

Solve eqn 1 for x.

$x + 4y = -19$ [1]

$x = -4y - 19$ [1]

Substitute for x in other equation ([2])

$-2x + 14y = -116$

$-2(-4y - 19) + 14y = -116$ (go to next page)

$-2(-4y-19)+14y=-116$

$8y+38+14y=-116$

$22y+38=-116$

$-38 \quad -38$

$\frac{22y}{22} = \frac{-154}{22}$

$y=-7$

If $y=-7$, what is $x$?

plug in $y$ to find $x$.

$x+4y=-19$

$x=-4y-19$ ← best choice!

$x=-4(-7)-19$

$=28-19$

$x=9$

$x=9 \quad y=-7$

$(9,-7)$

Solve by Elimination

(27)

$$\begin{cases} \frac{5}{6}x + \frac{2}{3}y = 7 & [1] \\ \frac{7}{12}x - \frac{5}{6}y = -2 & [2] \end{cases}$$

Hint: Clear both equations of fractions

[1] $6\left(\frac{5}{6}x + \frac{2}{3}y\right) = (7)(6)$ [1]  LCD = 6

$= 42$

$\frac{6}{1}\cdot\frac{5}{6}x + \frac{6}{1}\cdot\frac{2}{3}y$

$5x + 4y = 42$ [1]

[2] $\frac{12}{1}\left(\frac{7}{12}x - \frac{5}{6}y\right) = (-2)(12)$ [2]  LCD = 12

$\frac{12}{1}\cdot\frac{7}{12}x - \frac{12}{1}\cdot\frac{5}{6}y = -24$

$7x - 10y = -24$ [2]

$\rightarrow 10$ $[5x + 4y = 42]$

$4$ $[7x - 10y = -24]$