Semester Review Part 2

$y = |x|$ V

$y = [x]$ ---

$y = x^2$ U

$y < -2|x+4|-2$

Left 4 Down 2

$f(x) = 2[x+8] - 10$

Left 8 Down 10

$y = (x+4)^2 - 5$

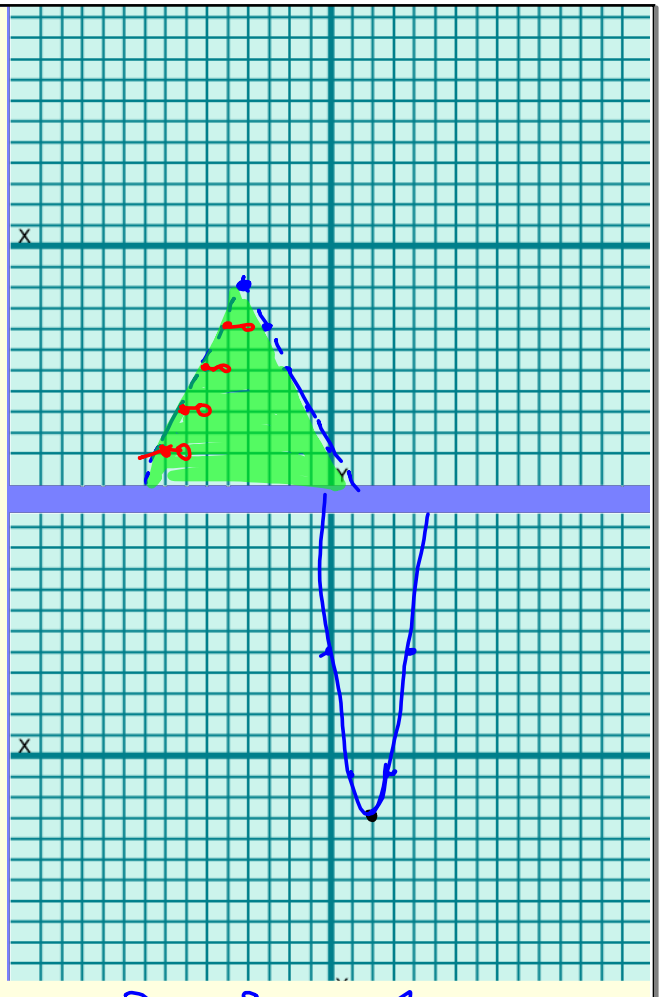
$y = 2x^2 + 8x + 5$

$x = -\frac{b}{2a}$ $y =$ Sub in x-coord.

$x = \frac{8}{2(2)} = 2$ $(2, -3)$

$y = 2(2)^2 - 8(2) + 5 = -3$

0	0
1	2
2	8
3	18



$3x - 8y = 24$

0	-3
8	0

$2x + 4y - 7z = 7$

$x - 5y + 3z = -4$ $\times -2$

$4x + y - 2z = 12$ $\times -4$

Eliminate same variable twice!

① $2x + 4y - 7z = 7$

$-2x + 10y - 6z = 8$

$14y - 13z = 15$

② $-4x + 20y - 12z = 16$

$4x + y - 2z = 12$

$21y - 14z = 28$

③ $3[14y - 13z = 15]$

$-2[21y - 14z = 28]$

$42y - 39z = 45$

$-42y + 28z = -56$

$-11z = -11$

$\frac{-11}{-11}$

$z = 1$

④ $14y - 13(1) = 15$

$14y - 13 = 15$

$14y = 28$

$y = 2$

⑤ Sub $y + z$ in a 3-variable eq.

$(-, -, -)$

Cramer's Rule

$$4x - 7y = -51$$
$$3x + 8y = 28$$

$$x = \frac{\begin{vmatrix} -51 & -7 \\ 28 & 8 \end{vmatrix}}{\begin{vmatrix} 4 & -7 \\ 3 & 8 \end{vmatrix}} = \frac{-408 + 196}{32 + 21} = \frac{-212}{53} = -4$$

$$y = \frac{\begin{vmatrix} 4 & -51 \\ 3 & 28 \end{vmatrix}}{\begin{vmatrix} 4 & -7 \\ 3 & 8 \end{vmatrix}}$$

$$5x + 7y - 7z = 115$$
$$2x - y + 9z = -88$$
$$3x + 4y - 8z = 119$$

$$\begin{bmatrix} 5 & 7 & -7 \\ 2 & -1 & 9 \\ 3 & 4 & -8 \end{bmatrix} \cdot \begin{bmatrix} x \\ y \\ z \end{bmatrix} = \begin{bmatrix} 115 \\ -88 \\ 119 \end{bmatrix}$$

$$\begin{bmatrix} 5 & 7 & -7 \\ 2 & -1 & 9 \\ 3 & 4 & -8 \end{bmatrix}^{-1} \cdot \begin{bmatrix} 115 \\ -88 \\ 119 \end{bmatrix}$$

$\sqrt{\frac{24}{4 \cdot 6}} + \sqrt{\frac{54}{9 \cdot 6}}$

$= 2\sqrt{6} + 3\sqrt{6}$

$= 5\sqrt{6}$

$\frac{5}{2\sqrt{7}} \cdot \frac{\sqrt{7}}{\sqrt{7}} = \frac{5\sqrt{7}}{14}$

$\frac{8\sqrt{7}}{16} = \frac{\sqrt{7}}{2}$

$\frac{7+3\sqrt{2}}{4-2\sqrt{2}} \cdot \frac{(4+2\sqrt{2})}{(4+2\sqrt{2})}$ ← FOIL ← FL

$= \frac{28+14\sqrt{2}+12\sqrt{2}+6 \cdot 2}{16-4 \cdot 2} = \frac{40+26\sqrt{2}}{8}$

$= \frac{20+13\sqrt{2}}{4}$

0.25 $i^1 = i$

0.5 $i^2 = -1$

0.75 $i^3 = -i$

0 $i^4 = 1$

$2i^{38} + 3i^{80} - 2i^{27}$

$\frac{38}{4} = 9.5$ $\frac{80}{4} = 20$ $\frac{27}{4} = 6.75$

$= 2(-1) + 3(1) - 2(-i)$

$= -2 + 3 + 2i$

$= 1 + 2i$

$(6+3i)(5-2i)$

$30 - 12i + 15i + 6i^2$

$36 + 3i$

December 8, 2021

Quadratics

Solve = must set eq = 0.

Factoring

$2x^2 - 15 = 7x$

$2x^2 - 7x - 15 = 0$ (3, 5, 15)

$(2x+3)(x-5) = 0$

$+3x$

$-10x$

$2x+3=0$ $\quad x-5=0$

$2x=-3$ $\quad x=5$

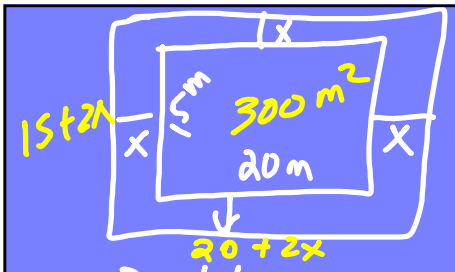
$x=-3/2$

Quadratic Formula

$$x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$$

$3x^2 - 18x + 47 = 0$

a b c



Double area

How wide is border?

$(15+2x)(20+2x)=600$

FOIL, Set = 0, solve.

Projectile Motion

$h(t)=\frac{1}{2}at^2+V_0t+S_0$

$a=-32\ \frac{ft}{s^2}$

$a=-9.8\ \frac{m}{s^2}$

$h(t)=\frac{1}{2}(-32)t^2+2000t+1$

$=-16t^2+2000t+1$

Maximum height

1) Find vertex
2) $t=-\frac{b}{2a}$
3) Sub t in to get h.

How many seconds to hit ground?

$h=0$

$0=-16t^2+2000t+1$

Solve with quadr. formula.