NO calculator

Algebra 2 Trig – First Semester Final Review
Free Response

NAME Key

1. Solve (and simplify) using the quadratic formula.
$x^2+6x=-15$

$x^2+6x+15=0$

$x=\frac{-6\pm\sqrt{36-4(1)(15)}}{2}$

$x=\frac{-6\pm\sqrt{36-60}}{2}$

$x=\frac{-6\pm\sqrt{-24}}{2}$

$x=\frac{-6\pm 2i\sqrt{6}}{2}$

$x=-3\pm i\sqrt{6}$

2. Given the following equation:
$x+5y=15$

a. Calculate the slope (m)

$\frac{5y}{5}=\frac{-x+15}{5}$ $\quad m=-\frac{1}{5}$

b. Calculate the x and y intercepts

$x=15$ $\quad y=3$

$(15,0)$ $\quad (0,3)$

3. Divide $(x^3+5x-3)\div(x+3)$

$-3\,|\,1\;\;0\;\;5\;\;-3$
$\quad\quad -3\;\;9\;\;-42$
$\quad 1\;-3\;\;14\;\;-45$

$x^2-3x+14-\frac{45}{x+3}$

4. Solve:
$\begin{cases}3x+2y+4z=11\\2x-y+3z=4\\5x-3y+5z=-1\end{cases}$

$7x+10z=19$
$7(-1x-4z=-13)$
$-7x-28z=-91$
$-18z=-72$
$z=4$

$-1x-4(4)=-13$
$x=-3$

$3(-3)+2y+4(4)=11$
$-9+2y+16=11$
$2y=4$
$y=2$

$(-3,2,4)$

5. Find the domain and range of the graph:

Domain: $(-\infty,\infty)$

Range: $(3,\infty)$

6. Simplify i^{31}

$i\cdot i$

$-i$

7. Multiply:

$$\begin{bmatrix} 2 & -1 & 3 \\ 1 & 6 & 0 \end{bmatrix} \bullet \begin{bmatrix} 5 & 1 & 2 \\ -3 & 0 & 4 \\ -2 & -1 & 7 \end{bmatrix}$$

$2\times3 \quad 3\times3$

$$\begin{bmatrix} 7 & -1 & 2 \\ -13 & 1 & 26 \end{bmatrix}$$

8. Solve using substitution or elimination:

$y = 2x^2 - x + 1$

$x^2 + 2x + 5 - y = 0$

$x^2 + 2x + 5 - (2x^2 - x + 1) = 0$

$x^2 + 2x + 5 - 2x^2 + x - 1 = 0$

$-x^2 + 3x + 4 = 0$

$-1(x^2 - 3x - 4) = 0$

$(x-4)(x+1) = 0$

$x = 4 \quad x = -1$

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

$y = 2(16) - 4 + 1$

$y = 32 - 4 + 1$

$y = 29$

$(4, 29)$

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

$y = 4$

$(-1, 4)$

9. You are the assistant manager of an appliance store. Next month you will order two types of stereo systems. Write the objective function. Write and graph the constraints.

- Model A: Your cost is $400.
- Model A: Your profit is $50

- Model B: Your cost is $500
- Model B: Your profit is $100

You expect a profit of at least $6000.
You expect to sell at least 100 units.

Let X = # of Model A
Let Y = # of Model B

Objective Function to Minimize Cost

$400x + 500y$ Min

Constraints

$$\begin{cases} x + y \geq 100 \\ 50x + 100y \geq 6000 \end{cases}$$

(0, 60) (120, 0)

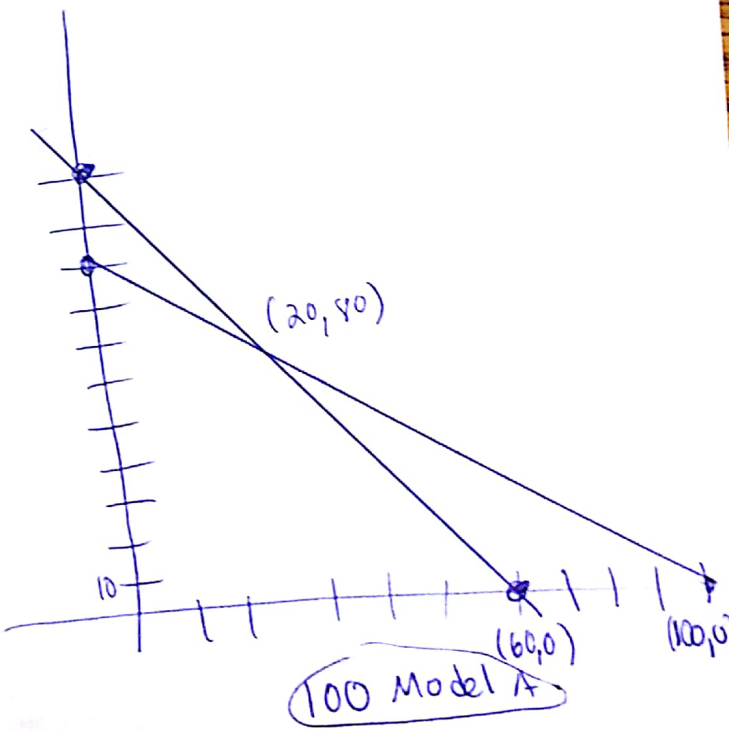
$-50x - 50y = -5000$

$50x + 100y = 6000$

$50y = 2000$

$y = 80$

Graph:



100 Model A