MathUG3 ALG Hw

03-27-19
03-29-19

1. $y = 16(0.25)^x$ eval if $x = 0, 1, 2$
2. $h(x) = -2x^2 + 8x$ $0 \le x \le 4$ graph
3. $f(x) = 16(0.50)^x$ eval if $x = 0, 1, 2$
4. $f(x) = \frac{1}{2}(2-x)^2$ eval if $x = 6$
5. $y = 4(2)^x$ eval if $x = -1, 0, 1$
6. $y + 2 = -2(x+4)$ if $x = 0$, find y
7. $C(x) = 1000(1.10)^x$ eval if $x = 0, 1, 2$
8. $y = -2x + 4$ eval if $x = -1$
9. $y = -x^2 - 6x - 8$ eval if $x = -3$
10. $.25(N - 20) + 3 = 10.5$ solve
11. $-1.5x + 30 = 0$ solve
12. $2x + 53 = 2(2x+1)$ solve
13. $-2x + 4 \ge 2x + 8$ solve
14. $(2x-5)^2$ solve
15. $(2x+3)(2x-3)$ solve
16. $(x^2 + 3x - 2)(-5x + 3)$ solve

17. $y = 2(x+3)^2 - 10$ write in $y = ax^2 + bx + c$ form

18. $(2x+1)(8-x) = 0$ solve

19. $x^2 + 10x + 24 = 0$ solve

20. $x^2 - 2x - 24 = 0$ solve

21. $4x^2 - 9$ factor

22. $-4x^2 + 14x$ factor

23. $(x+1)^2 = 4$ solve

24. $\sqrt{x+1} = 4$ solve

25. $6x^2 + 11x + 4 = 0$ Solve

26. $x^2 + 2x + 10 = 0$ Solve

27. $x^2 + 2x + 1 = 5$ solve

28. $4x^2 + 4x + 1 = 3$ Solve

29. 

if area = 140 then find w

30. (2, -20) and (-4, 40) find the slope

31. (2, 3) and (20, 3) find the slope

32. (-2, 4) and (-2, 6) find the slope

(33) $(-2,-1)$ and $(-4,-2)$ find equation of the line

(34) $m=50$ and $(10,900)$ find equation of the line

(35) $y=\frac{2}{5}x+1$ and $(2,-15)$ find the equation of the perpendicular line through the point

(36.) $x+y=3$ solve
$x-y=1$

(37.) $x=y+1$ Solve
$2x+2y=6$

(38) $\sqrt{24}$ simplify

(39) $\frac{\sqrt{3}+\sqrt{5}}{\sqrt{3}-\sqrt{5}}$ rationalize the denominator

(40.) $y=100(2)^x$ eval if $x=-2$

(41) $\frac{(x^4y^2)^{-3}}{x^{-2}y^{-10}}$ simplify

(42.) $\frac{6x^6y^9}{2y^7} \cdot \frac{8(x^2)^4}{y^{-20}}$ simplify

(43) $y = -2x + 4$ graph

(44) $y = -2$ graph

(45) $f(x) = 2$ graph

(46) $x = -2$ graph

(47) $y = x^2$ graph

(48) $y = x^2 - 4$ graph

(49) $y = -x^2 - 6x - 8$ graph

(50) $y = 2x$ and $y = 2x - 4$ solve by graphing

(51) if y varies directly with x and if $x = 3$ then $y = 150$. Find x if $y = 500$.

(52) Sequence
$a_n = -2n - 4$ eval if $n = 0, 1, 2, 3$

(53) $y = x$ and $y = \frac{1}{2}x$ Solve by graphing

(54) $y = 4(2)^{-x}$, $-1 \leq x \leq 3$ Graph

(55) $-3x \leq 2y - 2$ graph

(56) is $(2, 3)$ a solution of $2x - 3y \geq -9$

(57) If x-intercept $= -6$ and y-intercept $= 2$ then graph

(58) if $y = 2x + 4$ and domain $0 \le x \le 10$ find range and graph

(59) $y = x^2$ and $y = -\left(\frac{x}{3}\right)^2$ solve by graphing

(60) $(25x^6y^8z^{20})^{\frac{1}{2}}$ simplify

(61) $|x+1| > 4$ solve

(62) $x + y = 1300$ Solve
$10x + 5y = 9000$

(63) $2x + 3y = 3400$ Solve
$5x + 2y = 4100$

① $y = 16(0.25)^x$ eval if $x = 0, 1, 2$

$y = 16(0.25)^0$

$y = 16(1)$

$y = 16$

$y = 16(0.25)^1$

$y = 16(0.25)$

$y = 4$

$y = 16(0.25)^2$

$y = 16(0.25)(0.25)$

$y = 16(.0625)$

$y = 1$

(2.) $h(x) = -2x^2 + 8x$, domain $0 \le x \le 4$

graph

$h(0) = -2(0)^2 + 8(0)$

$h(0) = -2(0)(0) + 8(0)$

$h(0) = -2(0) + 8(0)$

$h(0) = 0 + 0$

$h(0) = 0$

$h(1) = -2(1)^2 + 8(1)$

$h(1) = -2(1)(1) + 8(1)$

$h(1) = -2(1) + 8(1)$

$h(1) = -2 + 8$

$h(1) = 6$

$h(2) = -2(2)^2 + 8(2)$

$h(2) = -2(2)(2) + 8(2)$

$h(2) = -2(4) + 8(2)$

$h(2) = -8 + 16$

$h(2) = 8$

$h(3) = -2(3)^2 + 8(3)$

$h(3) = -2(3)(3) + 8(3)$

$h(3) = -2(9) + 8(3)$

$h(3) = -18 + 24$

$h(3) = 6$

$h(4) = -2(4)^2 + 8(4)$

$h(4) = -2(4)(4) + 8(4)$

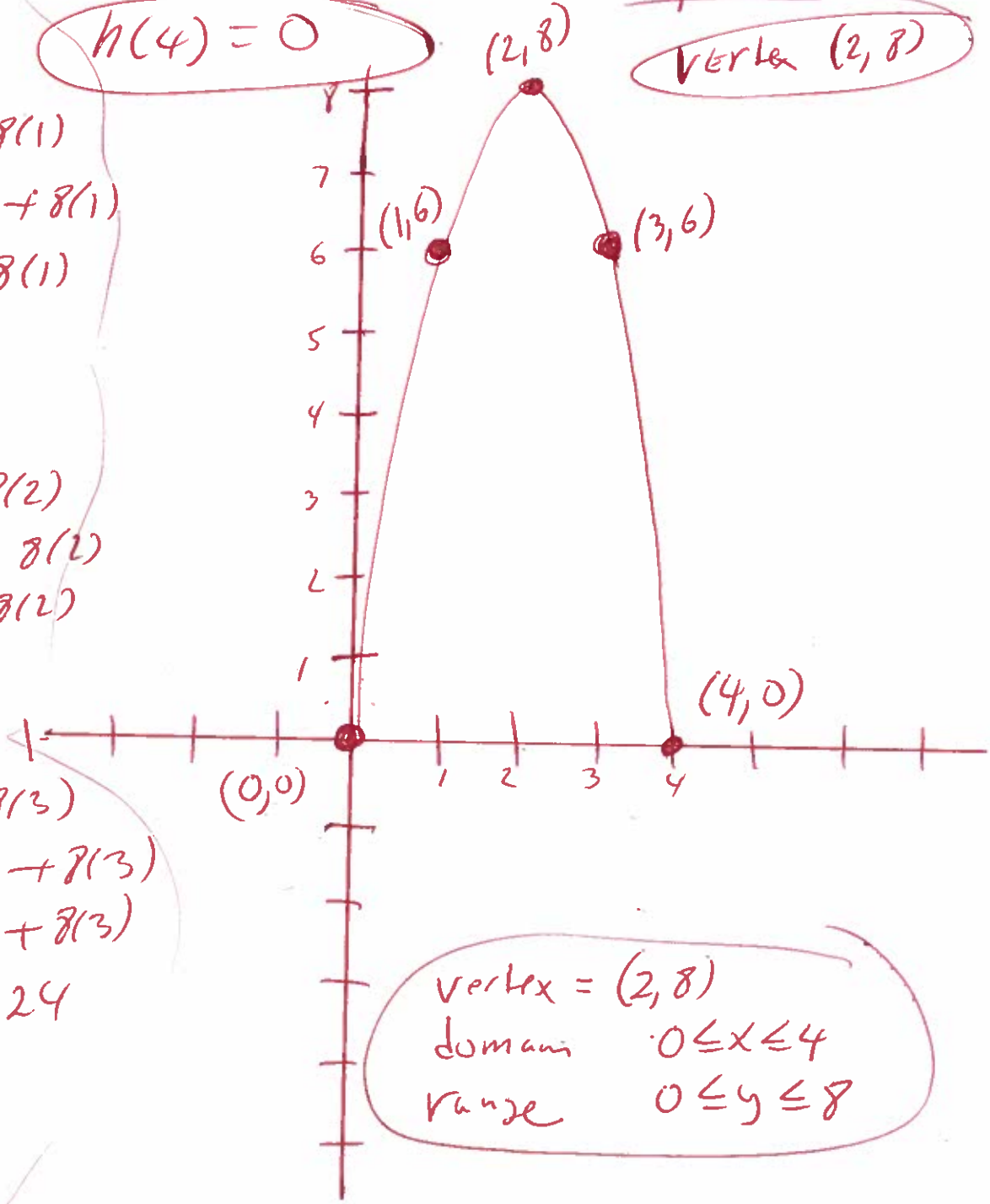
$h(4) = -2(16) + 8(4)$

$h(4) = -32 + 32$

$h(4) = 0$

x	h(x)
0	0
1	6
2	8
3	6
4	0

Verte (2, 8)



vertex = (2, 8)

domain $0 \le x \le 4$

range $0 \le y \le 8$

(3) $f(x) = 16(0.50)^x$ eval $x = 0, 1, 2$

$f(0) = 16(0.50)^0$

$f(0) = 16(1)$

any number to 0 is 1 Power

$f(0) = 16$

OR $(0, 16)$ ✓

$f(1) = 16(0.50)^1$

$f(1) = 16(0.50)$

$f(1) = 8$

OR $(1, 8)$ ✓✓

$f(2) = 16(0.50)^2$

$f(2) = 16(0.50)(0.50)$

$f(2) = 16(.25)$

$f(2) = 4$

OR $(2, 4)$ ✓✓

(4) $f(x) = \frac{1}{2}(2-x)^2$ and $x = 6$

$f(6) = \frac{1}{2}(2-(6))^2$

$f(6) = \frac{1}{2}(2-6)^2$

$f(6) = \frac{1}{2}(-4)^2$

$f(6) = \frac{1}{2}(-4)(-4)$

$f(6) = \frac{1}{2}(16)$

$f(6) = \frac{1}{2}\left(\frac{16}{1}\right)$

$f(6) = \frac{16}{2}$

$f(6) = 8$

OR $(6, 8)$

5. $y = 4(2)^x$ eval $x = -1, 0, 1$

$y = 4(2)^{-1}$

$y = 4(2^{-1})$

$y = 4\left(\frac{1}{2^1}\right)$ rewrite

$y = 4\left(\frac{1}{2}\right)$

$y = \frac{4}{2}$

$y = 2$

$y = 4(2)^0$

$y = 4(1)$ 2 to zero power is 1

$y = 4$

$y = 4(2)^1$

$y = 4(2)$

$y = 8$

---

6. $y+2=-2(x+4)$ find y if $x=0$

$y+2=-2((0)+4)$

$y+2=-2(0+4)$

$y+2=-2(4)$

$y+2=-8$

$y+2-2=-8-2$

$y=-10$ ✓

OR

$(x, y)=(0, -10)$ ✓

7. $C(x) = 1000(1.10)^x$ eval $x = 0, 1, 2$

$C(0) = 1000(1.10)^0$

$C(0) = 1000(1)$

$C(0) = 1000$

$C(1) = 1000(1.10)^1$

$C(1) = 1000(1.10)$

$C(1) = 1100$

$C(2) = 1000(1.10)^2$

$C(2) = 1000(1.10)(1.10)$

$C(2) = 1000(1.21)$

$C(2) = 1210$

(8) $y = -2x + 4$ eval if $x = -1$

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

$y = 2 + 4$

$y = 6$

OR

$(x, y) = (-1, 6)$

(9) $y = -x^2 - 6x - 8$ eval if $x = -3$

$y = -(-3)^2 - 6(-3) - 8$

$y = -(-3)(-3) - 6(-3) - 8$

$y = -(9) - 6(-3) - 8$

$y = -9 + 18 - 8$

$y = 9 - 8$

$y = 1$

OR

$(x, y) = (-3, 1)$

(10) $.25(n-20)+3=10.5$

$.25n-5+3=10.5$

$.25n-2=10.5$

$.25n-2+2=10.5+2$

$.25n=12.5$

$\frac{.25n}{.25}=\frac{12.5}{.25}$

$n=50$

11. $-1.5x + 30 = 0$

$-1.5x + 30 - 30 = 0 - 30$

$-1.5x = -30$

$\frac{-1.5x}{-1.5} = \frac{-30}{-1.5}$

$x = 20$

(12) $2x+53 = 2(2x+1)$

$2x+53 = 4x+2$

$2x+53-53 = 4x+2-53$

$2x = 4x-51$

$2x-4x = 4x-51-4x$

$-2x = -51$

$\frac{-2x}{-2} = \frac{-51}{-2}$

$x = \frac{51}{2}$

OR

$x = 25\frac{1}{2}$

OR

$x = 25.5$

(or) division

$$
\begin{array}{r}
25\frac{1}{2} \\
2\overline{)51} \\
-(4) \\
\hline
11 \\
-(10) \\
\hline
1 \text{ rem}
\end{array}
$$

(13) $-2x + 4 \geq 2x + 8$

$-2x + 4 - 4 \geq 2x + 8 - 4$

$-2x \geq 2x + 4$

$-2x - 2x \geq 2x + 4 - 2x$

$-4x \geq 4$

$\frac{-4x}{-4} \leq \frac{4}{-4}$

divide by a negative and turn alligator around

$x \leq -1$

$(-\infty, -1]$

(14) $(2x-5)^2 =$

$(2x-5)(2x-5) =$

$4x^2 - 10x - 10x + 25 =$

$4x^2 - 20x + 25 =$

15. $(2x+3)(2x-3) =$

$4x^2 - 6x + 6x - 9 =$

$4x^2 + 0x - 9 =$

$4x^2 - 9 =$

16. $(x^2+3x-2)(-5x+3)=$

$-5x^3+3x^2-15x^2+9x+10x-6=$

$-5x^3-12x^2+19x-6=$

vertex form

17) $y = 2(x+3)^2 - 10$

STANDARD Form

write in $y = ax^2 + bx + c$ form

$y = 2(x+3)(x+3) - 10$

$y = 2(x^2 + 3x + 3x + 9) - 10$

$y = 2(x^2 + 6x + 9) - 10$

$y = 2x^2 + 12x + 18 - 10$

$y = 2x^2 + 12x + 8$

Sjh

(18) $(2x+1)(8-x)=0$

Let $2x+1=0$ OR $8-x=0$

$2x+1-1=0-1$ OR ~~$8-x-8=0-8$~~

$2x=-1$ OR $-x=-8$

$\frac{2x}{2}=\frac{-1}{2}$ OR $-1x=-8$

OR $\frac{-1x}{-1}=\frac{-8}{-1}$

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

OR $x=8$

(19) $x^2 + 10x + 24 = 0$

Sum — Possible
24, 1
12, 2
6, 4
3, 8

$(x+4)(x+6) = 0$

Set $x+4=0$ OR $x+6=0$

$x+4-4=0-4$ OR $x+6-6=0-6$

$x=-4$ OR $x=-6$

(20) Solve

$x^2 - 2x - 24 = 0$

Possibly
24, 1
12, 2
6, 4
3, 8

$(x+4)(x-6) = 0$

Let $x+4=0$ OR $x-6=0$

$x+4-4=0-4$ OR $x-6+6=0+6$

$x=-4$ OR $x=6$

21) $4x^2 - 9 =$ factor

$(2x)^2 - (3)^2 =$

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

formula

$a^2 - b^2 =$

$(a+b)(a-b) =$

22. $-4x^2+14x =$ Factor

$-2x(2x-7) =$

(23) Solve

$(x+1)^2 = 4$

$\sqrt{(x+1)^2} = \pm\sqrt{4}$

$x+1 = \pm 2$

Let $x+1 = -2$ OR $x+1 = 2$

$x+1-1 = -2-1$ OR $x+1-1 = 2-1$

$x = -3$ OR $x = 1$

Check

$(x+1)^2 = 4$

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

$(-2)^2 = 4$

$(-2)(-2) = 4$

$4 = 4$

Good

$(x+1)^2 = 4$

$(1+1)^2 = 4$

$(2)^2 = 4$

$(2)(2) = 4$

$4 = 4$

Good

(24) $\sqrt{x+1} = 4$

$(\sqrt{x+1})^2 = (4)^2$

$x+1 = 16$

$x+1-1 = 16-1$

$x = 15$

Check

$\sqrt{x+1} = 4$

$\sqrt{15+1} = 4$

$\sqrt{16} = 4$

$4 = 4$

Good

25. $6x^2 + 11x + 4 = 0$

Possible: 6, 1 / 4, 1 / 2, 3 / 2, 2

$(2x + 1)(3x + 4) = 0$

Set $2x + 1 = 0$ OR $3x + 4 = 0$

$2x + 1 - 1 = 0 - 1$ OR $3x + 4 - 4 = 0 - 4$

$2x = -1$ OR $3x = -4$

$\frac{2x}{2} = \frac{-1}{2}$ OR $\frac{3x}{3} = \frac{-4}{3}$

$x = -\frac{1}{2}$ OR $x = -\frac{4}{3}$

(26) $x^2+2x+10=0$

Sorry Use Quadratic formula

$1x^2+2x+10=0$

$a=1,\ b=2,\ c=10$

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

$$x=\frac{-(2)\pm\sqrt{(2)^2-4(1)(10)}}{2(1)}$$

$$x=\frac{-2\pm\sqrt{4-40}}{2}$$

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

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

$$x=-1\pm 3i$$

$x=-1-3i$ OR $x=-1+3i$

27. $x^2 + 2x + 1 = 5$

Solve use Quadratic Formula

rewrite

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

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

$1x^2 + 2x - 4 = 0$

$a = 1,\ b = 2,\ c = -4$

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

$$x = \frac{-(2) \pm \sqrt{(2)^2 - 4(1)(-4)}}{2(1)}$$

$$x = \frac{-2 \pm \sqrt{4 + 16}}{2}$$

$$x = \frac{-2 \pm \sqrt{20}}{2}$$

$$x = \frac{-2 \pm \sqrt{4 \cdot 5}}{2}$$

$$x = \frac{-2 \pm \sqrt{4}\sqrt{5}}{2}$$

$$x = \frac{-2 \pm 2\sqrt{5}}{2}$$

$$x = -1 \pm 1\sqrt{5}$$

$$x = -1 \pm \sqrt{5}$$

$x = -1 - \sqrt{5}$ or $x = -1 + \sqrt{5}$

Prime 2, 3, 5, 7

2 | 20

2 | 10

5 | 5

1

(28.) $4x^2+4x+1=3$

Solve using Quadratic formula

$4x^2+4x+1-3=3-3$

$4x^2+4x-2=0$ (rewrite)

$a=4,\ b=4,\ c=-2$

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

$$x=\frac{-(4)\pm\sqrt{(4)^2-4(4)(-2)}}{2(4)}$$

$$x=\frac{-4\pm\sqrt{16+32}}{8}$$

$$x=\frac{-4\pm\sqrt{48}}{8}$$

$$x=\frac{-4\pm\sqrt{16\cdot 3}}{8}$$

$$x=\frac{-4\pm\sqrt{16}\sqrt{3}}{8}$$

$$x=\frac{-4\pm 4\sqrt{3}}{8}$$

$$x=\frac{4(-1\pm 1\sqrt{3})}{4(2)}$$

Primes 2, 3, 5, 7

2 | 48
2 | 24
2 | 12
2 | 6
3 | 3
1

$$x=\frac{-1\pm 1\sqrt{3}}{2}$$

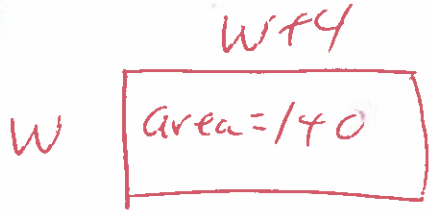
$$x=-\frac{1}{2}\pm\frac{1}{2}\sqrt{3}$$

$x=-\frac{1}{2}-\frac{1}{2}\sqrt{3}$

OR

$x=-\frac{1}{2}+\frac{1}{2}\sqrt{3}$

(29)



find W rectangle

$A = LW$ area of a rectangle

$140 = (W+4)(W)$

$140 = W^2 + 4W$

$140 - 140 = W^2 + 4W - 140$

$0 = W^2 + 4W - 140$

$W^2 + 4W - 140 = 0$

$(W-10)(W+14) = 0$

Possible
140, 1
70, 2
35, 4
20, 7
14, 10

Set $W-10=0$ OR $W+14=0$

$W-10+10=0+10$ OR $W+14-14=0-14$

$W=10$ OR $W=-14$

(has to be positive)

can not be negative width

$W=10$

$W = \text{width} = 10$

$W+4 =$

$10+4 =$

$W+4 = 10+4 = 14 = \text{Length}$

14

(30) $(2, -20)$ and $(-4, 40)$ find slope

$x_1 \quad y_1 \qquad x_2 \quad y_2$

$$m = \frac{y_1 - y_2}{x_1 - x_2}$$

$$m = \frac{(-20) - (40)}{(2) - (-4)}$$

$$m = \frac{-20 - 40}{2 + 4}$$

$$m = \frac{-60}{6}$$

$$m = \frac{-10(6)}{(6)}$$

$$m = -10$$

(31) (2, 3) and (20, 3) Find Slope

x_1 y_1 x_2 y_2

$$m = \frac{y_1 - y_2}{x_1 - x_2}$$

$$m = \frac{(3) - (3)}{(2) - (20)}$$

$$m = \frac{3 - 3}{2 - 20}$$

$$m = \frac{0}{-18}$$

$$m = 0$$

(32.) $(-2,4)$ and $(-2,6)$ find slope
$x_1\ y_1 \qquad x_2\ y_2$

$$m = \frac{y_1 - y_2}{x_1 - x_2}$$

$$m = \frac{(4)-(6)}{(-2)-(-2)}$$

$$m = \frac{4-6}{-2+2}$$

$$m = \frac{-2}{0}$$ ← Can not divide by zero

Slope is undefined

(33) $(-2,-1)$ and $(-4,-2)$ find the equation of the line

$x_1\ y_1 \qquad x_2\ y_2$

$$y - y_1 = \frac{y_1 - y_2}{x_1 - x_2}(x - x_1)$$

$$y-(-1) = \frac{(-1)-(-2)}{(-2)-(-4)}(x-(-2))$$

$$y+1 = \frac{-1+2}{-2+4}(x+2)$$

$$y+1 = \frac{1}{2}(x+2)$$

$$y+1 = \frac{1}{2}x + \frac{2}{2}$$

$$y+1-1 = \frac{1}{2}x + \frac{2}{2} - 1$$

$$y = \frac{1}{2}x + \frac{2}{2} - \frac{2}{2} \quad \text{rewrite}$$

$$y = \frac{1}{2}x + \frac{2-2}{2}$$

$$y = \frac{1}{2}x + \frac{0}{2}$$

$$y = \frac{1}{2}x + \frac{0}{2}$$

$$y = \frac{1}{2}x$$

(34) $m = 50$ = slope $(10, 900)$ find the equation of x_1 y_1 the line

$$y - y_1 = m(x - x_1)$$

$$y - (900) = 50(x - (10))$$

$$y - 900 = 50(x - 10)$$

$$y - 900 = 50x - 500$$

$$y - 900 + 900 = 50x - 500 + 900$$

$$y = 50x + 400$$

(35) $y = \frac{2}{5}x + 1$ $(2, -15)$ $x_1 \quad y_1$ Find the equation of the line perpendicular

$m_{perp} = -\frac{5}{2} = m$ new slope

$y - y_1 = m(x - x_1)$

$y - (-15) = -\frac{5}{2}(x - (2))$

$y + 15 = -\frac{5}{2}(x - 2)$

$y + 15 = -\frac{5}{2}x + \frac{10}{2}$

$y + 15 = -\frac{5}{2}x + 5$

$y + 15 - 15 = -\frac{5}{2}x + 5 - 15$

$y = -\frac{5}{2}x - 10$

(36) Solve the system

$x+y=3$

$x-y=1$

$2x+0=4$

$2x=4$

$\frac{2x}{2}=\frac{4}{2}$

$x=2$

subst

$x+y=3$

$(2)+y=3$

$2+y=3$

$2+y-2=3-2$

$y=1$

$(x, y)=(2, 1)$

(37) $x = y + 1$ Solve the System

$2x + 2y = 6$

$2(y+1) + 2y = 6$

$2y + 2 + 2y = 6$

$4y + 2 = 6$

$4y + 2 - 2 = 6 - 2$

$4y = 4$

$\frac{4y}{4} = \frac{4}{4}$

$y = 1$

Subst

$x = y + 1$

$x = (1) + 1$

$x = 1 + 1$

$x = 2$

$(x, y) = (2, 1)$

(38) Simplify

Primes 2, 3, 5, 7.

$\sqrt{24} =$

$\sqrt{2^3 \cdot 3^1} =$

$\sqrt{2^2 \cdot 2^1 3^1} =$

$2^{2/2}\sqrt{2^1 3^1} =$

$2^1\sqrt{2^1 3^1} =$

$2\sqrt{2 \cdot 3} =$

$2\sqrt{6} =$

2	24
2	12
2	6
3	3
	1

(39.) $\frac{\sqrt{3}+\sqrt{5}}{\sqrt{3}-\sqrt{5}}$ rationalize denominator

$\left(\frac{\sqrt{3}+\sqrt{5}}{\sqrt{3}-\sqrt{5}}\right)\left(\frac{\sqrt{3}+\sqrt{5}}{\sqrt{3}+\sqrt{5}}\right) =$ F & Mult

$\frac{(\sqrt{3})^2+\sqrt{3}\sqrt{5}+\sqrt{3}\sqrt{5}+(\sqrt{5})^2}{(\sqrt{3})^2+\sqrt{3}\sqrt{5}-\sqrt{3}\sqrt{5}-(\sqrt{5})^2} =$

$\frac{(\sqrt{3})^2+2\sqrt{3}\sqrt{5}+(\sqrt{5})^2}{(\sqrt{3})^2-(\sqrt{5})^2} =$

$\frac{3+2\sqrt{3}\sqrt{5}+5}{3-5} =$

$\frac{8+2\sqrt{3}\sqrt{5}}{-2} =$

$\frac{8}{-2}+\frac{2\sqrt{3}\sqrt{5}}{-2} =$

$-4-1\sqrt{3}\sqrt{5} =$

$-4-\sqrt{3}\sqrt{5}$

$-4-\sqrt{6} =$

(40.) $y = 100(2)^x$ evaluate if $x = -2$

$y = 100(2)^{-2}$

$y = 100(2^{-2})$

$y = 100\left(\frac{1}{2^2}\right)$

$y = 100\left(\frac{1}{2 \cdot 2}\right)$

$y = 100\left(\frac{1}{4}\right)$

$y = \frac{100}{1}\left(\frac{1}{4}\right)$

$y = \frac{100}{4}$

$y = 25$

(41) $\dfrac{(x^4y^2)^{-3}}{x^{-2}y^{-10}} =$ Simplify

$\dfrac{x^{4(-3)}y^{2(-3)}}{x^{-2}y^{-10}} =$

$\dfrac{x^{-12}y^{-6}}{x^{-2}y^{-10}} =$

$\dfrac{x^2y^{10}}{x^{12}y^6} =$ Rewrite

$\dfrac{y^{10-6}}{x^{12-2}} =$

$\dfrac{y^4}{x^{10}} =$

(42.) $\frac{6x^6y^9}{2y^7} \cdot \frac{8(x^2)^4}{y^{-20}} =$ Simplify

$\frac{6x^6y^9}{2y^7} \cdot \frac{8(x^{2(4)})}{y^{-20}} =$

$\frac{6x^6y^9}{2y^7} \cdot \frac{8x^8}{y^{-20}} =$

$\frac{6x^6y^9}{2y^7} \cdot \frac{8x^8y^{20}}{1} =$ rewrite

$\frac{48x^{6+8}y^{9+20}}{2y^7} =$

$\frac{48x^{14}y^{29}}{2y^7} =$

$\frac{2(24)x^{14}y^{29-7}}{2} =$

$24x^{14}y^{22} =$

(43) $y = -2x + 4$ Graph

x	y
0	4
1	2
2	0

$y = -2(0) + 4$

$y = 0 + 4$

$y = 4$

$y = -2(1) + 4$

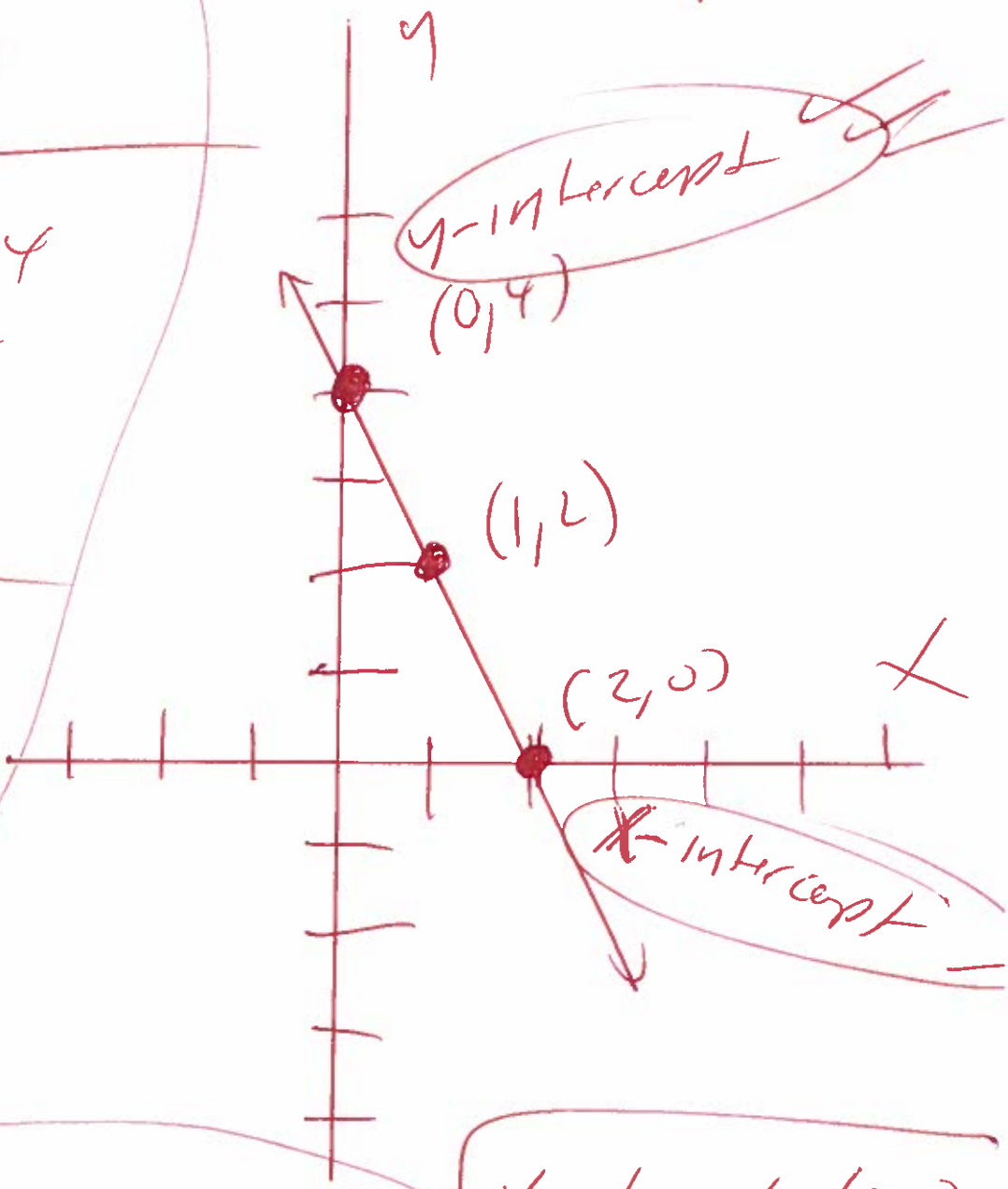
$y = -2 + 4$

$y = 2$

$y = -2(2) + 4$

$y = -4 + 4$

$y = 0$



domain all real numbers

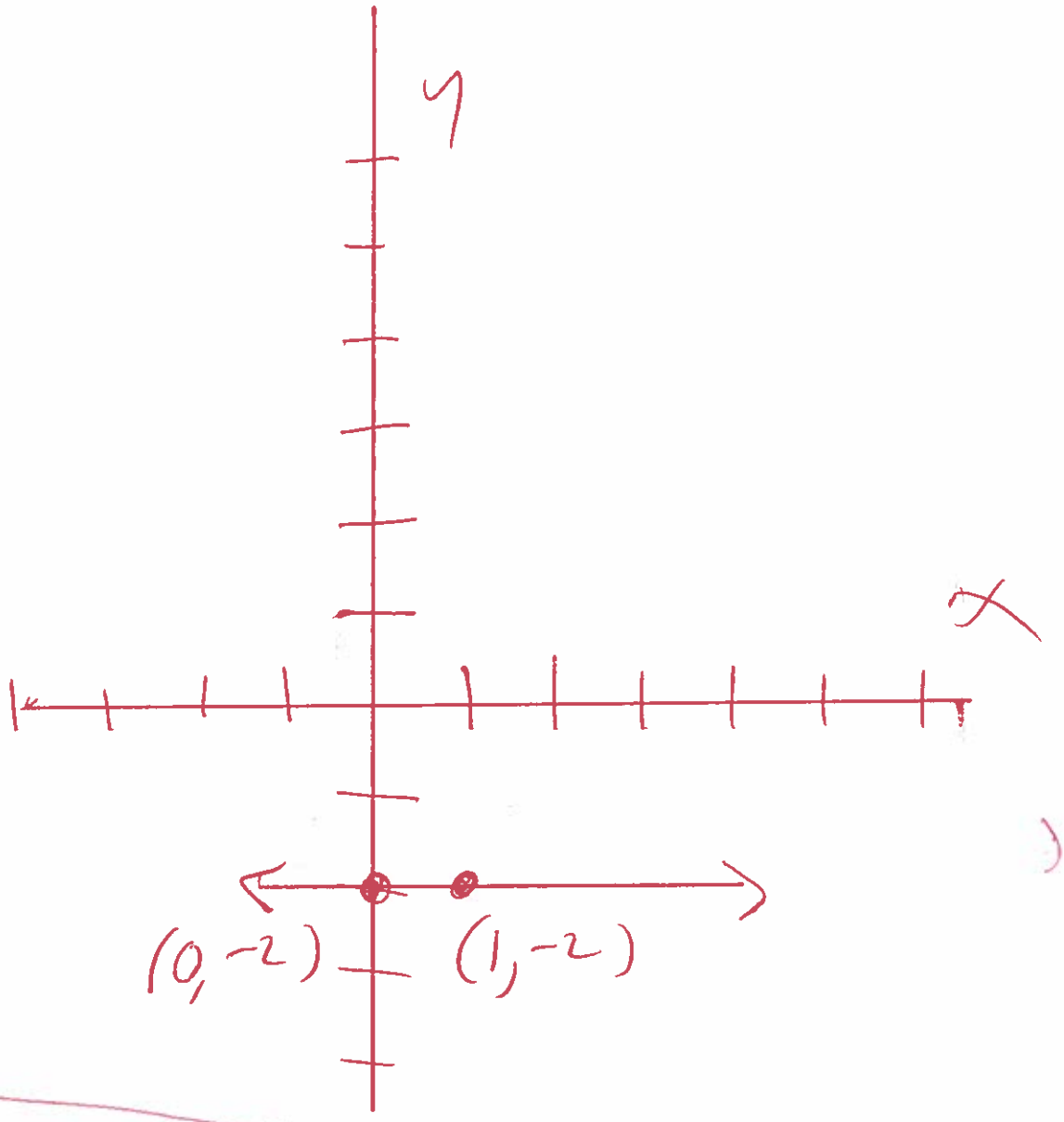
range all real numbers

x-intercept (2,0)

y-intercept (0,4)

(44.) $y = -2$ graph

x	y
0	-2
1	-2



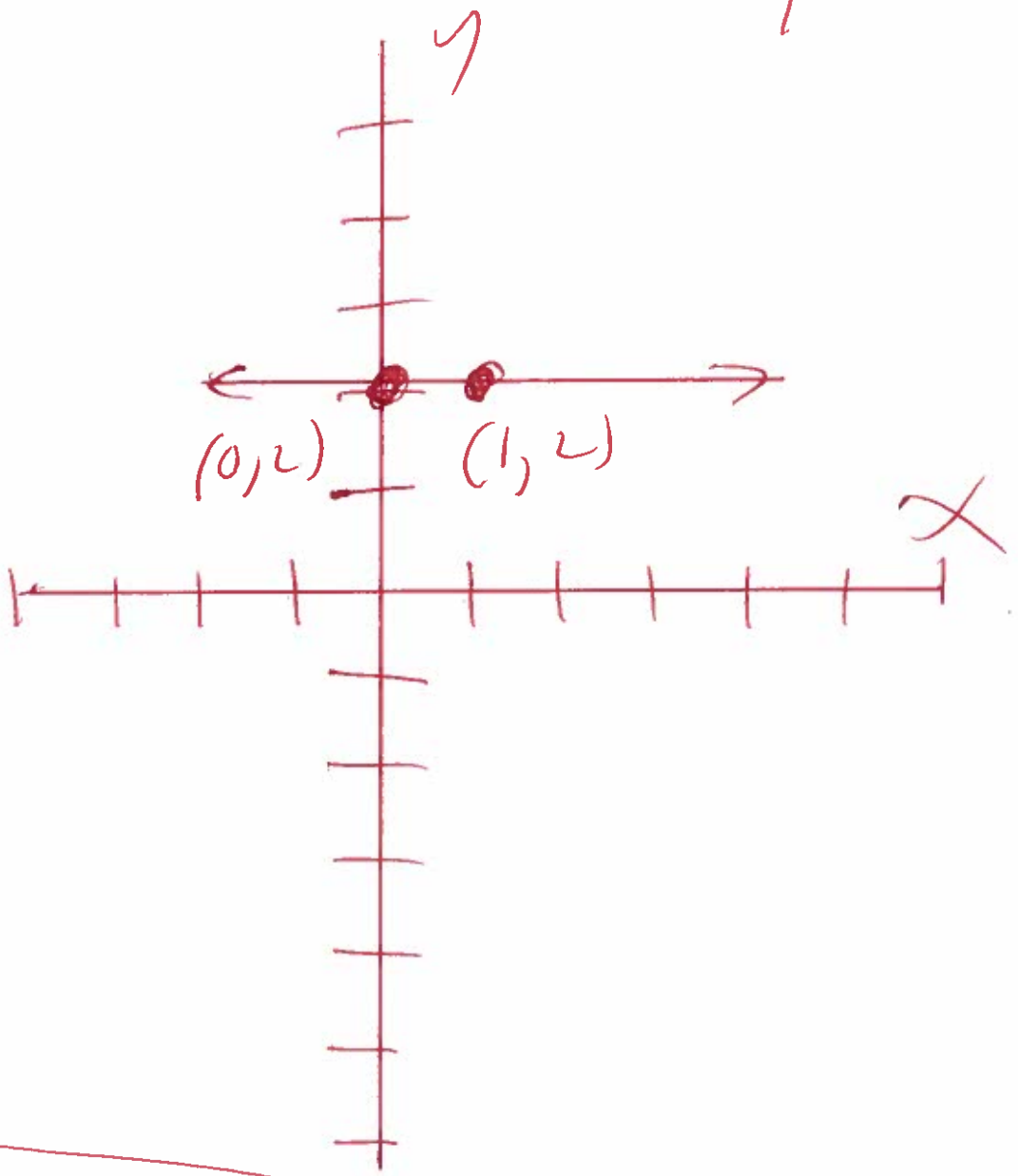
domain all real numbers

range = $\{-2\}$

Slope = 0 = m

45. $f(x) = 2$ graph

x	$f(x)$
0	2
1	2

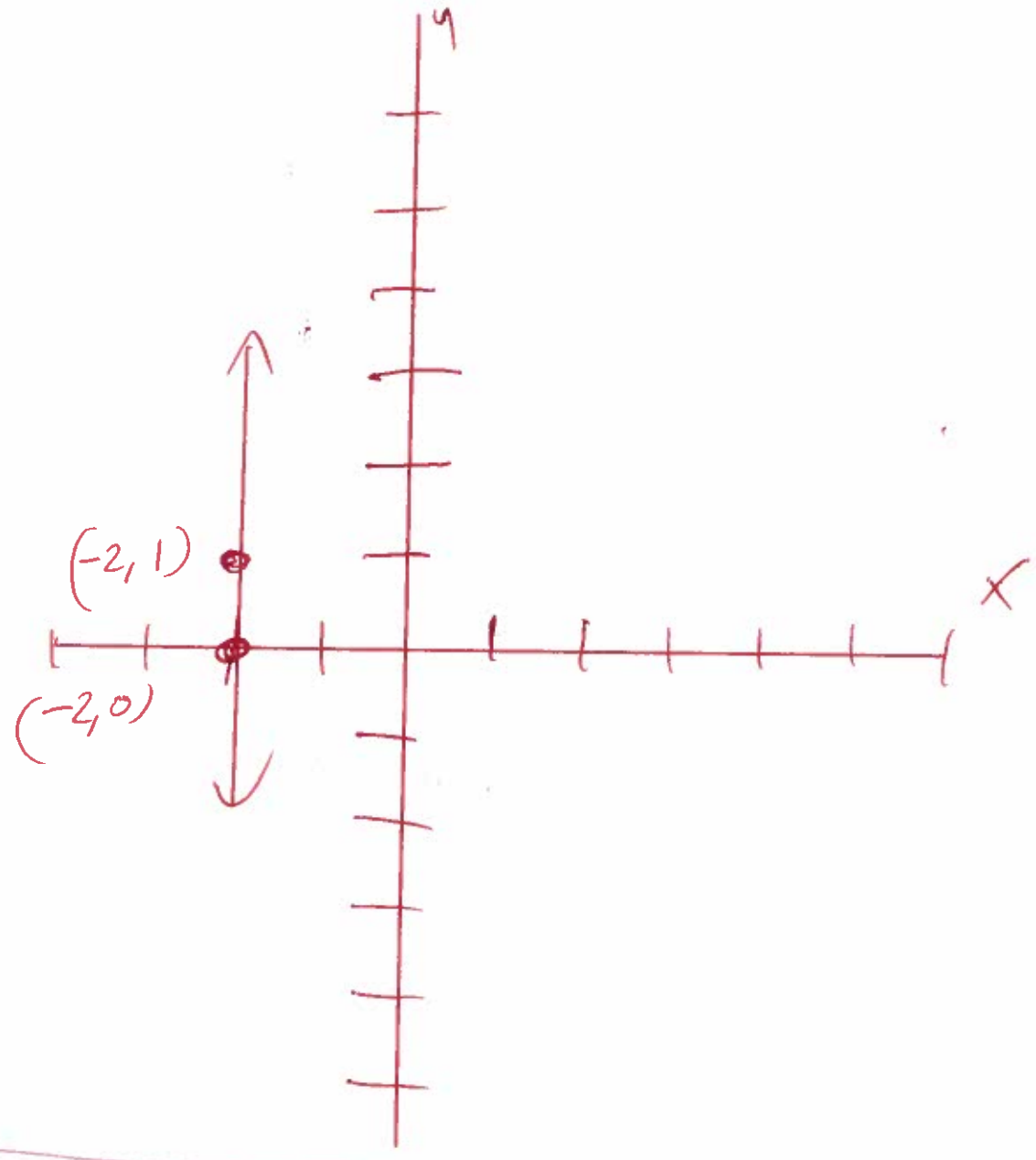


domain all real numbers
range = {2}

Slope = 0 = m

(46) $x = -2$ graph

x	y
-2	0
-2	1



domain = {-2}

range = all real numbers

Slope is undefined

(47) graph

$y = x^2$

x	y
-1	1
0	0
1	1

$y = (-1)^2$

$y = (-1)(-1)$

$y = 1$

$y = (0)^2$

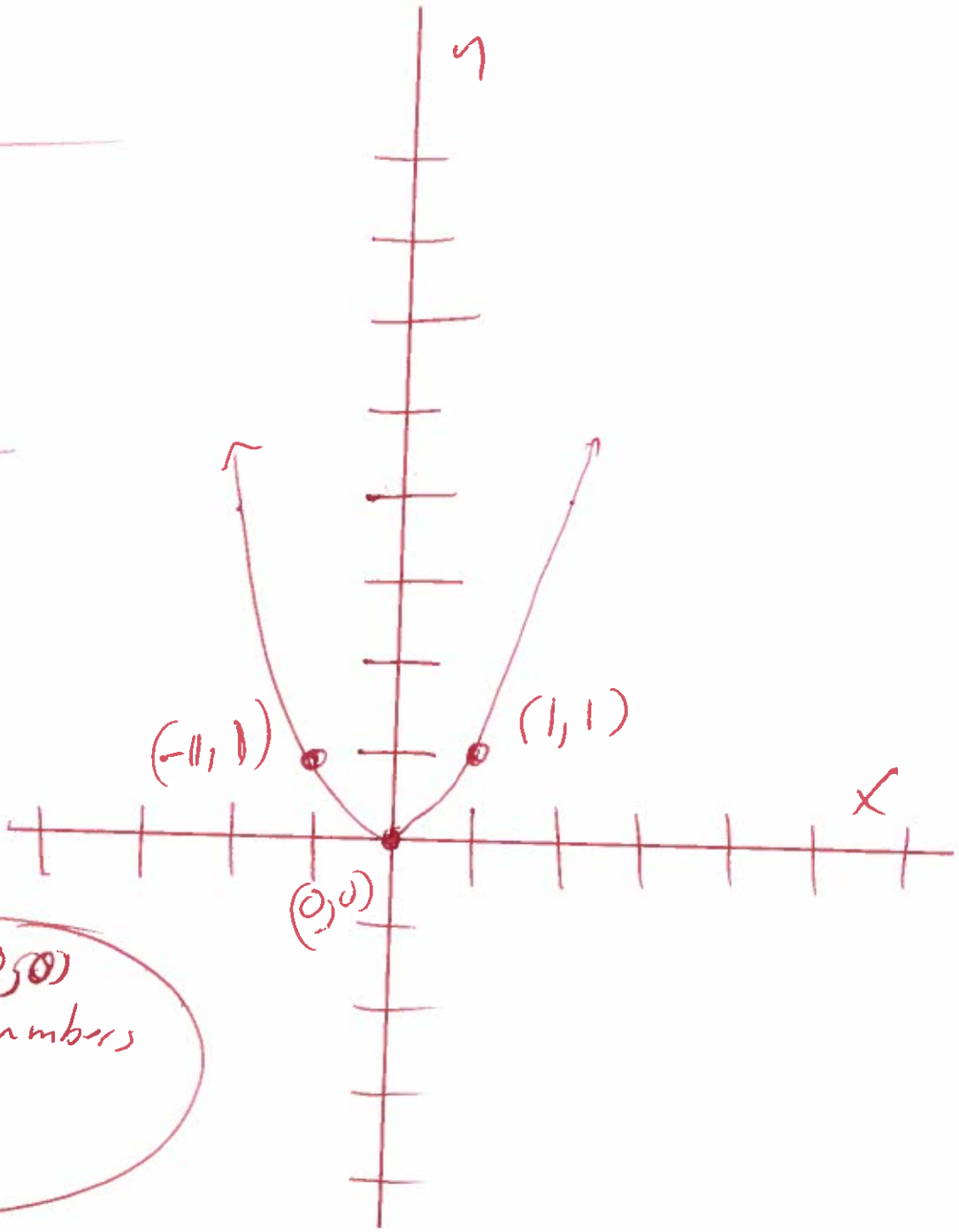
$y = (0)(0)$

$y = 0$

$y = (1)^2$

$y = (1)(1)$

$y = 1$



vertex = (0, 0)

domain all real numbers

range $[0, \infty)$

(48.) $y = x^2 - 4$ graph

x	y
-1	-3
0	-4
1	-3

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

$y = (-1)(-1) - 4$

$y = 1 - 4$

$y = -3$

$y = (0)^2 - 4$

$y = (0)(0) - 4$

$y = 0 - 4$

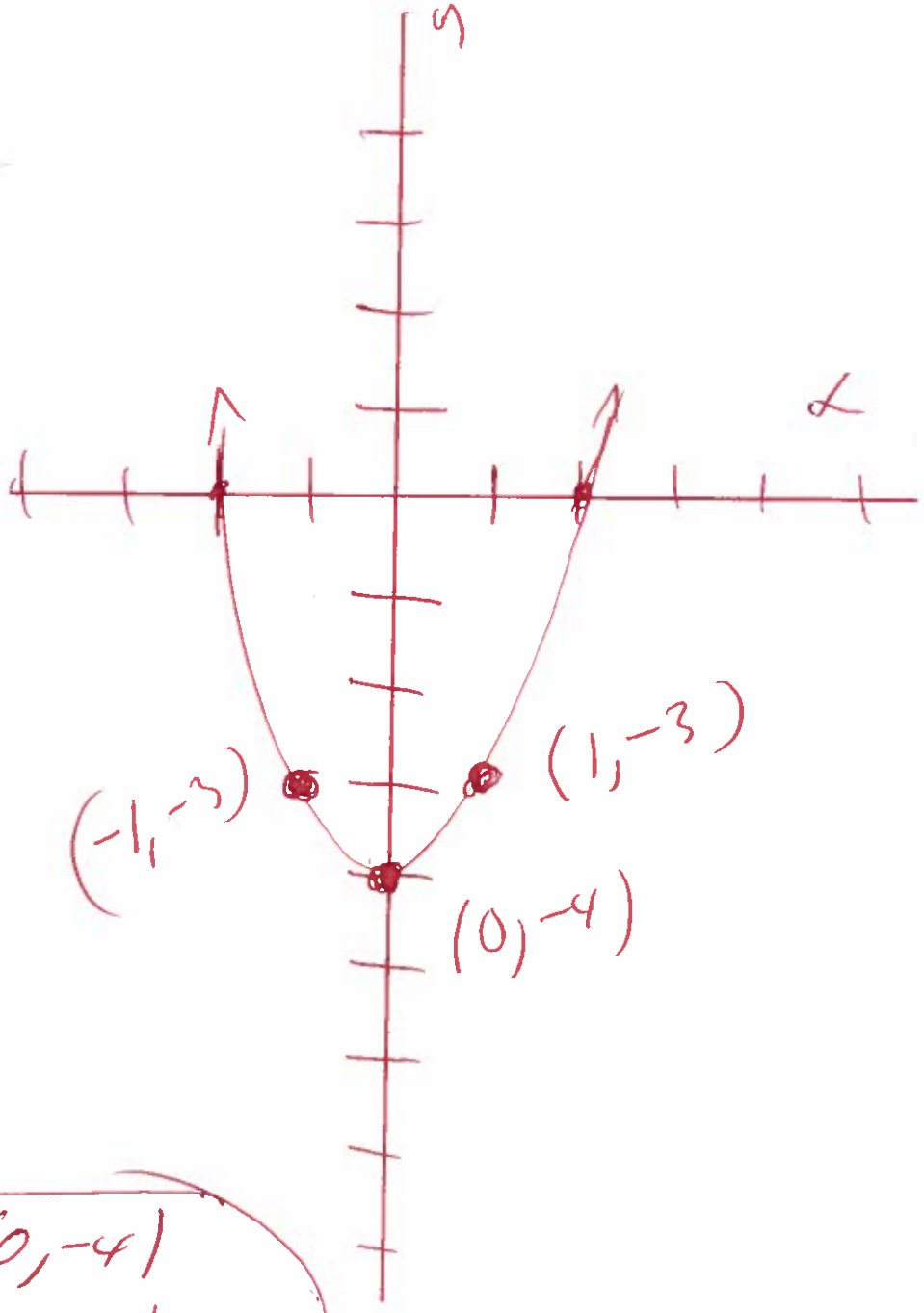
$y = -4$

$y = (1)^2 - 4$

$y = (1)(1) - 4$

$y = 1 - 4$

$y = -3$



Vertex = (0, -4)

domain ~~all real numbers~~

range $[-4, \infty)$

(49) $y = -x^2 - 6x - 8$ graph

$y = -1x^2 - 6x - 8$

$a = -1, \quad b = -6, \quad c = -8$

Vertex $= \left(-\frac{b}{2a}, f\left(\frac{-b}{2a}\right)\right)$

Vertex $= \left(\frac{-(-6)}{2(-1)}, f\ \frac{-(-6)}{2(-1)}\right)$

Vertex $= \left(\frac{6}{-2}, f\left(\frac{6}{-2}\right)\right)$

Vertex $= (-3, f(-3))$

Vertex $= (-3, -(-3)^2 - 6(-3) - 8)$

Vertex $= (-3, -(-3)(-3) - 6(-3) - 8)$

Vertex $= (-3, -(9) - 6(-3) - 8)$

Vertex $= (-3, -9 + 18 - 8)$

Vertex $= (-3, 9 - 8)$

Vertex $= (-3, 1)$

Find y-intercept let $x = 0$

$y = -(0)^2 - 6(0) - 8$

$y = -(0)(0) - 6(0) - 8$

$y = 0 - 0 - 8$

$y = -8$

$(0, -8)$ y-intercept

Find x-intercept

Let $y = 0$

$0 = -x^2 - 6x - 8$

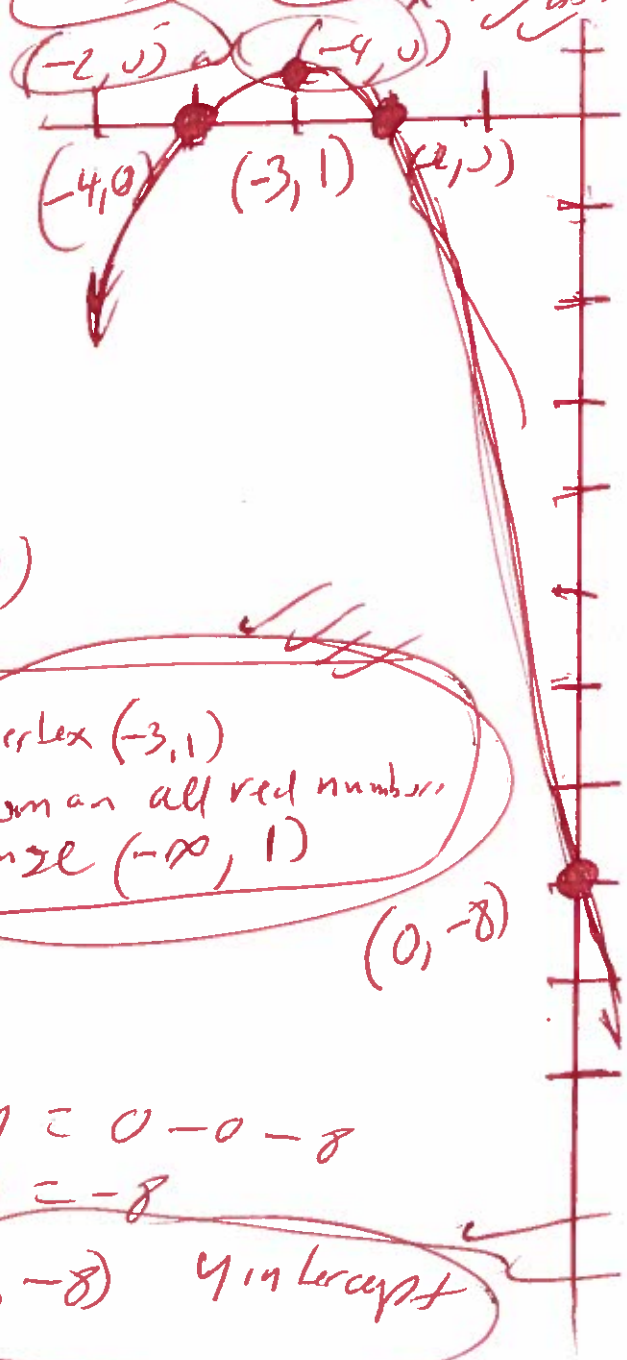
$0 = -1(x^2 + 6x + 8)$

$0 = -(x+2)(x+4)$

$x = 0 \quad x+2 = 0 \quad x+4 = 0$

$x+2-2 = 0-2 \quad x+4-4 = 0-4$

$x = -2 \quad x = -4$ x-intercepts



vertex $(-3, 1)$

domain all real numbers

range $(-\infty, 1]$

50. $y = 2x$

$y = 2x - 4$

Graph
Solve the system of equations

x	y
0	0
1	2

$y = 2x$

$y = 2(0)$

$y = 0$

$y = 2(1)$

$y = 2$

$y = 2x - 4$

$y = 2(0) - 4$

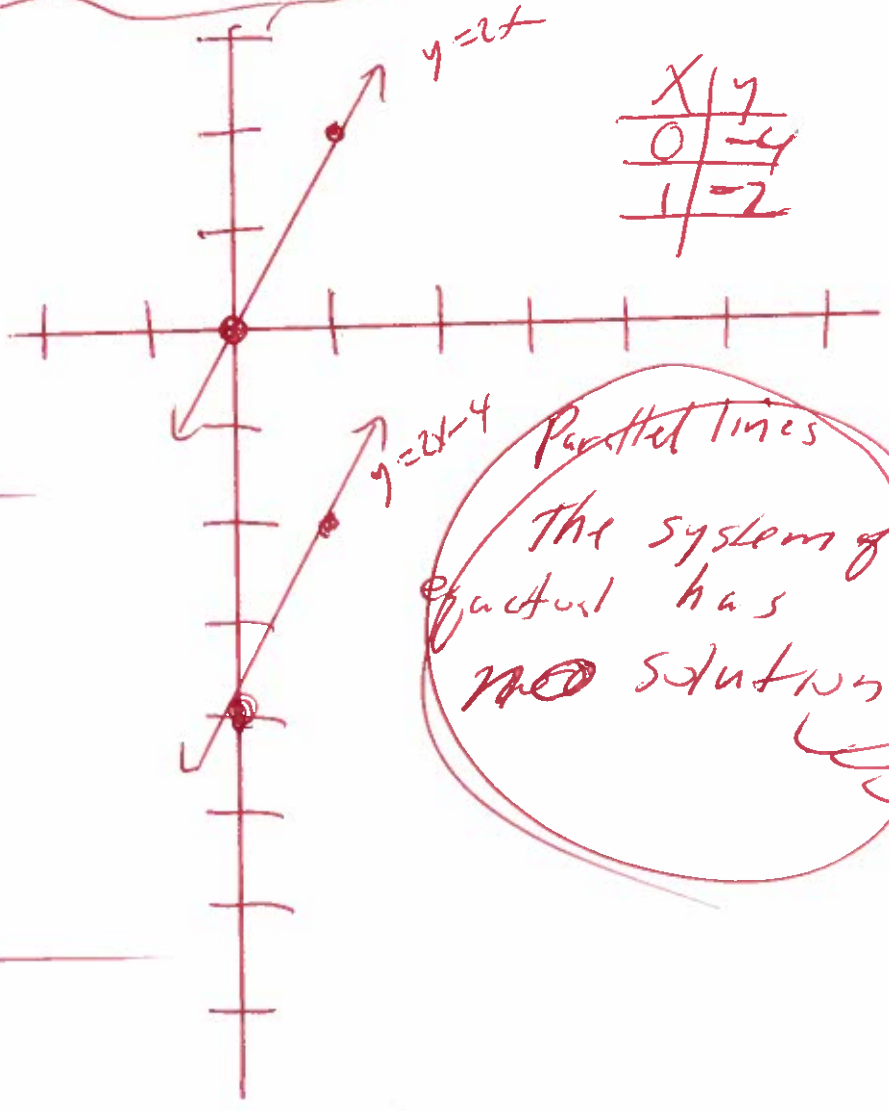
$y = 0 - 4$

$y = -4$

$y = 2(1) - 4$

$y = 2 - 4$

$y = -2$



x	y
0	-4
1	-2

Parallel lines

The system of equations has no solutions

51. y varies directly with x. If $x = 3$ then $y = 150$. find x if $y = 500$.

$y = kx$ ← varies directly

$x = 3$, $y = 150$

$150 = k(3)$

$150 = 3k$

$\frac{150}{3} = \frac{3k}{3}$

$50 = k$

$y = kx$

$y = 50x$

Find x if $y = 500$

Subst

$500 = 50x$

$\frac{500}{50} = \frac{50x}{50}$

$10 = x$

$x = 10$ if $y = 500$

(52) $a_n = -2n - 4$ eval $n = 0, 1, 2, 3$

$a_0 = -2(0) - 4$

$a_0 = 0 - 4$

$a_0 = -4$

$a_1 = -2(1) - 4$

$a_1 = -2 - 4$

$a_1 = -6$

$a_2 = -2(2) - 4$

$a_2 = -4 - 4$

$a_2 = -8$

$a_3 = -2(3) - 4$

$a_3 = -6 - 4$

$a_3 = -10$

(53) $y = x$

$y = \frac{1}{2}x$

Graph

Solve the system by graphing

$y = x$

$y = 0$

$y = 1$

x	y
0	0
1	1

$y = \frac{1}{2}x$

$y = \frac{1}{2}(0)$

$y = 0$

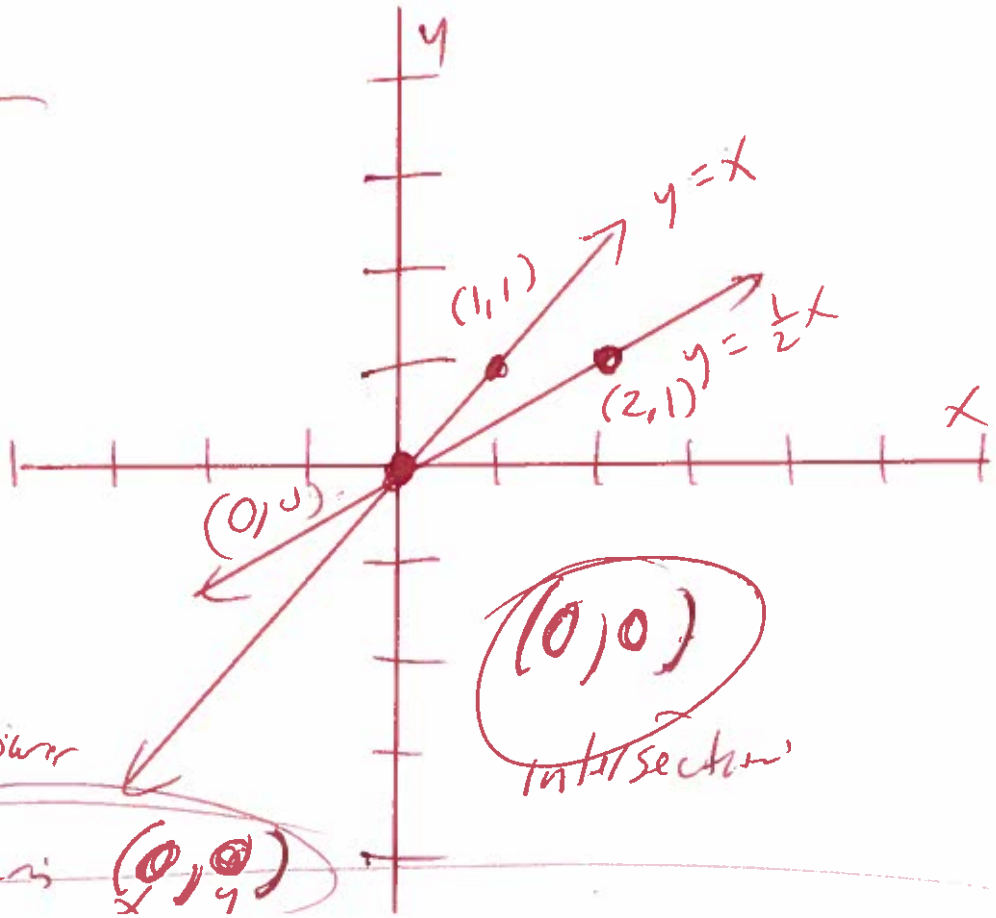
$y = \frac{1}{2}(2)$

$y = \frac{1}{2}\left(\frac{2}{1}\right)$

$y = \frac{2}{2}$

$y = 1$

x	y
0	0
2	1



(0,0)

intersection

answer

Solution $(0, 0)$

(54) $y = 4(2)^{-x}$

graph

domain $-1 \le x \le 3$

$y = 4(2)^{-(-1)}$

$y = 4(2)^{1}$

$y = 4(2)$

$y = 8$

$y = 4(2)^{-(0)}$

$y = 4(2)^{0}$

2 to zero power

$y = 4(1)$

$y = 4$

$y = 4(2)^{-(1)}$

$y = 4(2)^{-1}$

$y = 4(2^{-1})$

$y = 4 \cdot \left(\frac{1}{2^1}\right)$

$y = 4 \cdot \frac{1}{2}$

$y = \frac{4}{1} \cdot \frac{1}{2}$

$y = 2$

range $\left[\frac{1}{2}, 8\right]$

$y = 4(2)^{-(2)}$

$y = 4(2^{-2})$

$y = 4\left(\frac{1}{2^2}\right)$

$y = 4 \cdot \frac{1}{4}$

$y = \frac{4}{4}$

$y = 1$

$y = 4(2)^{-(3)}$

$y = 4(2^{-3})$

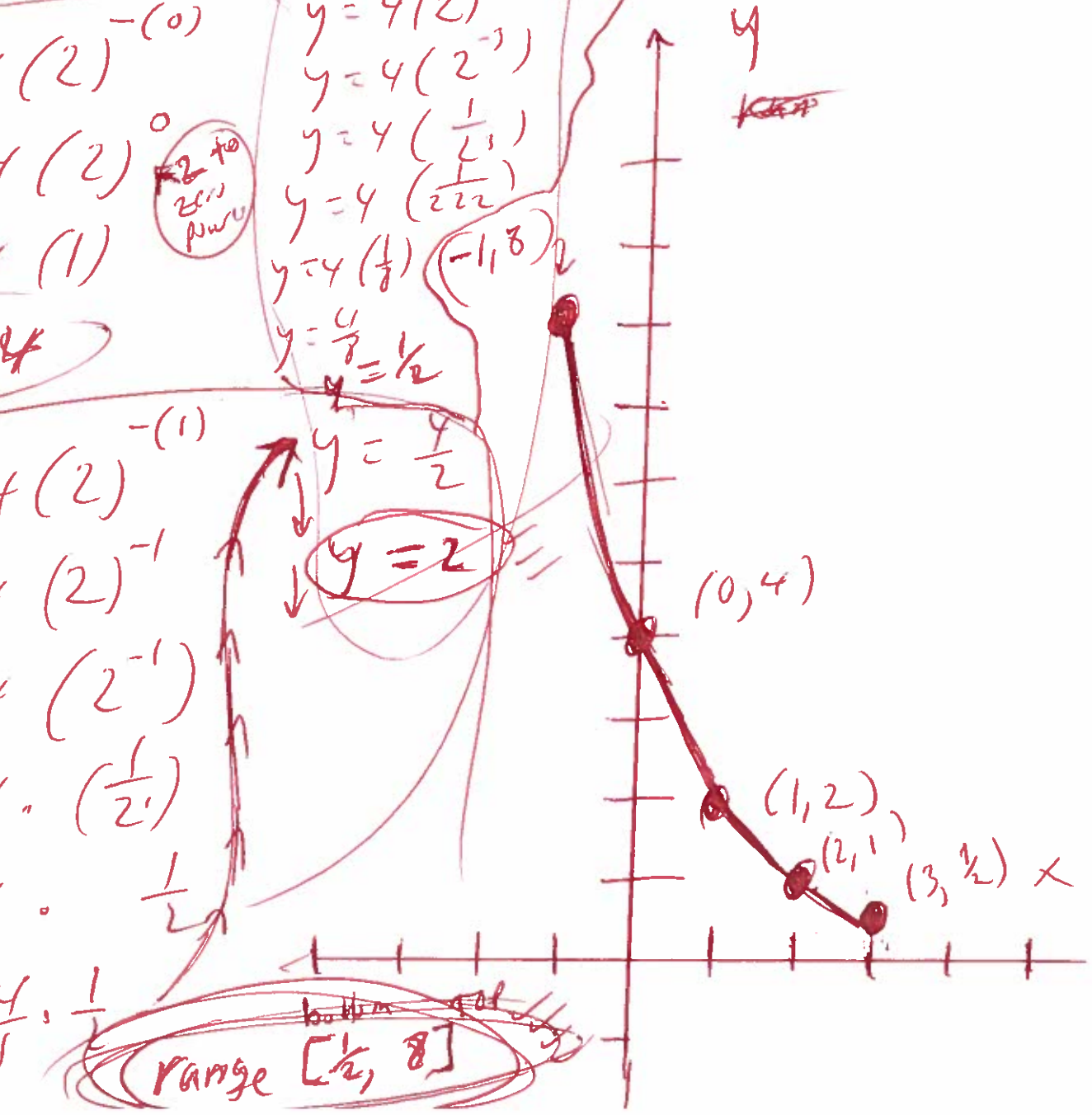
$y = 4\left(\frac{1}{2^3}\right)$

$y = 4\left(\frac{1}{222}\right)$

$y = 4\left(\frac{1}{8}\right)$

$y = \frac{4}{8} = \frac{1}{2}$

x	y
-1	8
0	4
1	2
2	1
3	$\frac{1}{2}$



(55) $-3x \leq 2y - 2$ graph

$-3x - 2y \leq -2$

$-3x - 2y + 3x \leq -2 + 3x$

$-2y \leq -2 + 3x$

$\frac{-2y}{-2} \geq \frac{-2}{-2} + \frac{3x}{-2}$ divide by a negative and turn all signs around

$y \geq 1 - \frac{3}{2}x$

$y \geq -\frac{3}{2}x + 1$

x	y
0	1
2	-2

$y = -\frac{3}{2}x + 1$

$y = -\frac{3}{2}(0) + 1$

$y = 0 + 1$

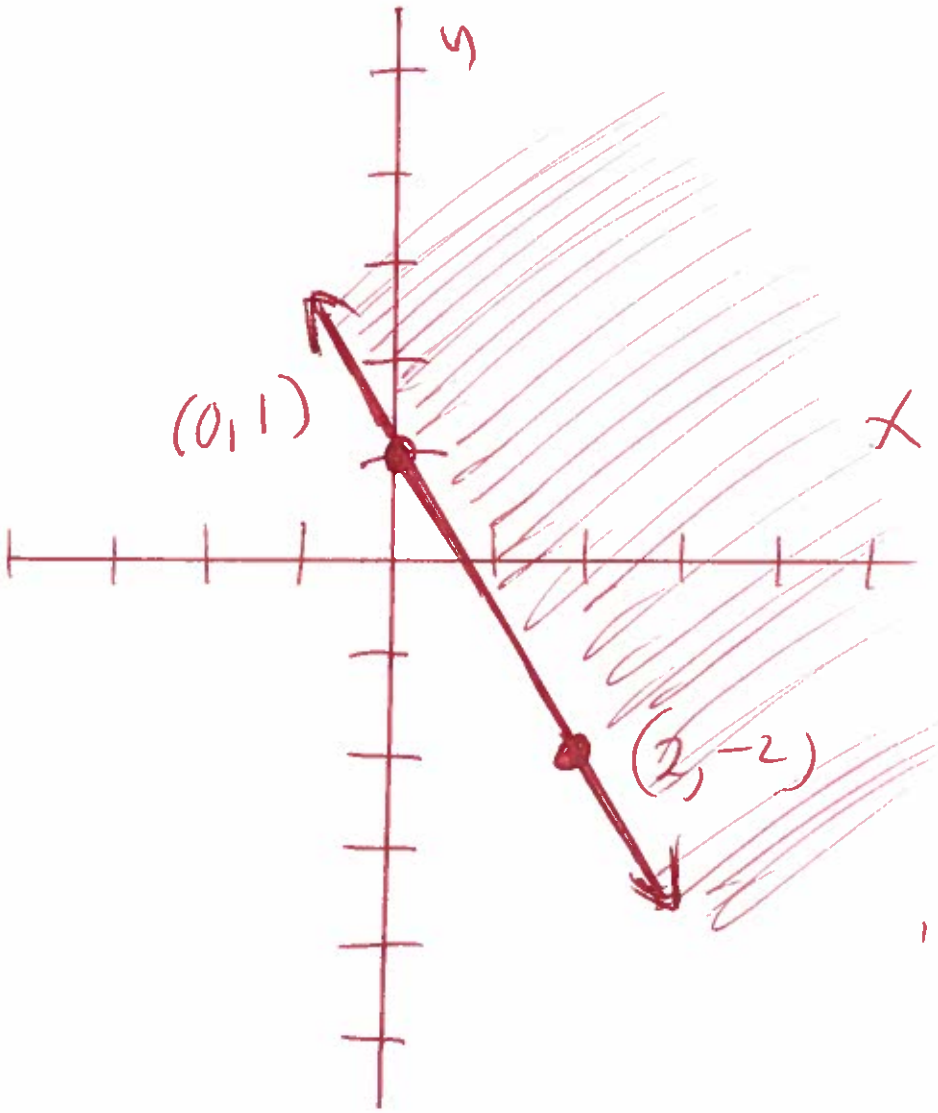
$y = 1$

$y = -\frac{3}{2}x + 1$

$y = -\frac{3}{2}(2) + 1$

$y = -3 + 1$

$y = -2$



56) Is $(2, 3)$ (x, y) a solution?

$2x - 3y \geq -9$

$2(2) - 3(3) \geq -9$ subst

$4 - 9 \geq -9$

$-5 \geq -9$

Yes

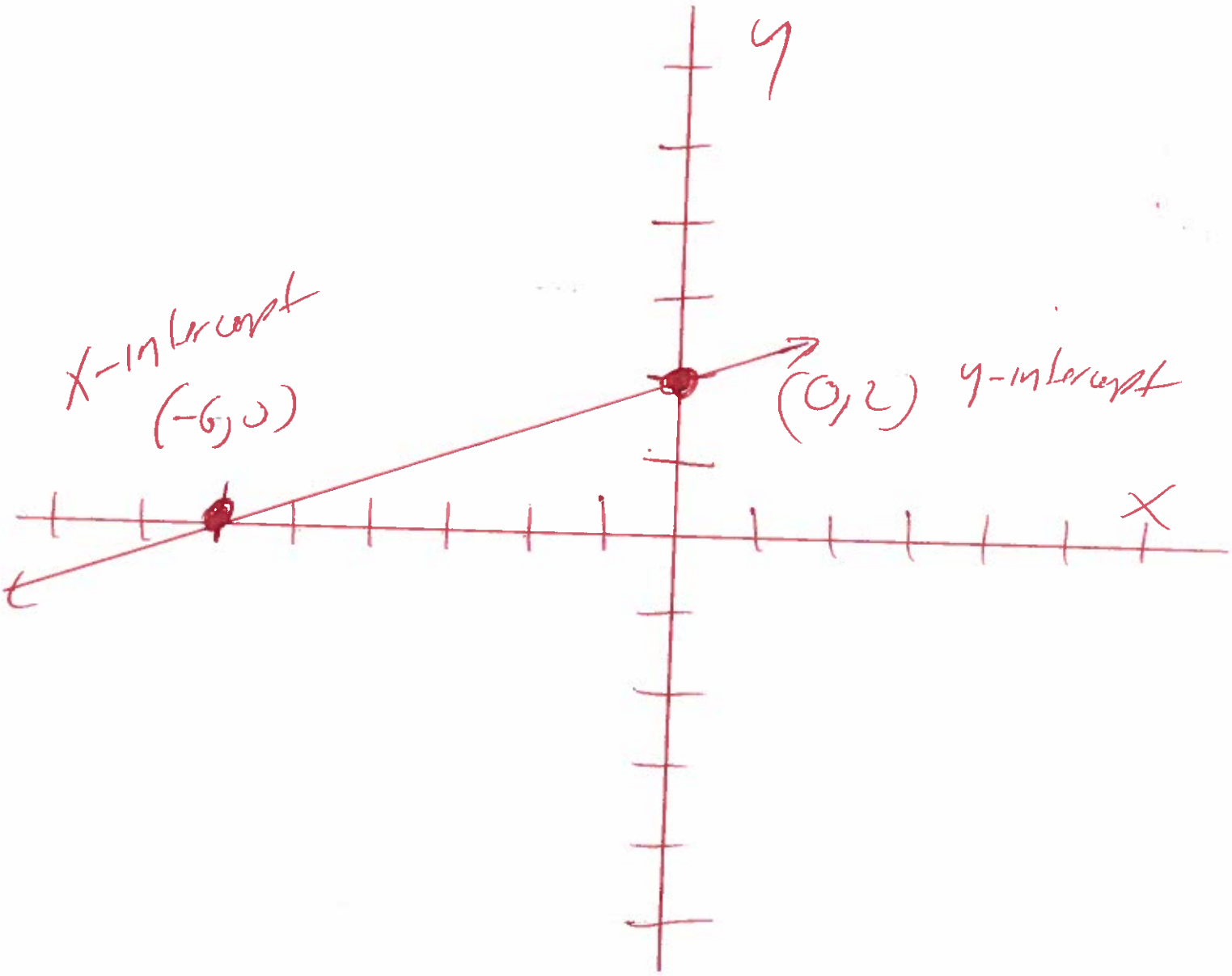
(57) x-intercept $= -6$

y-intercept $= 2$

Graph

x-intercept $= -6$ Means $(\underset{x}{-6}, \underset{y}{0})$ Point

y-intercept $= 2$ Means $(\underset{x}{0}, \underset{y}{2})$ Point



(58.) $y = 2x + 4$ and domain $0 \le x \le 10$

graph

$y = 2x + 4$

$y = 2(0) + 4$

$y = 0 + 4$

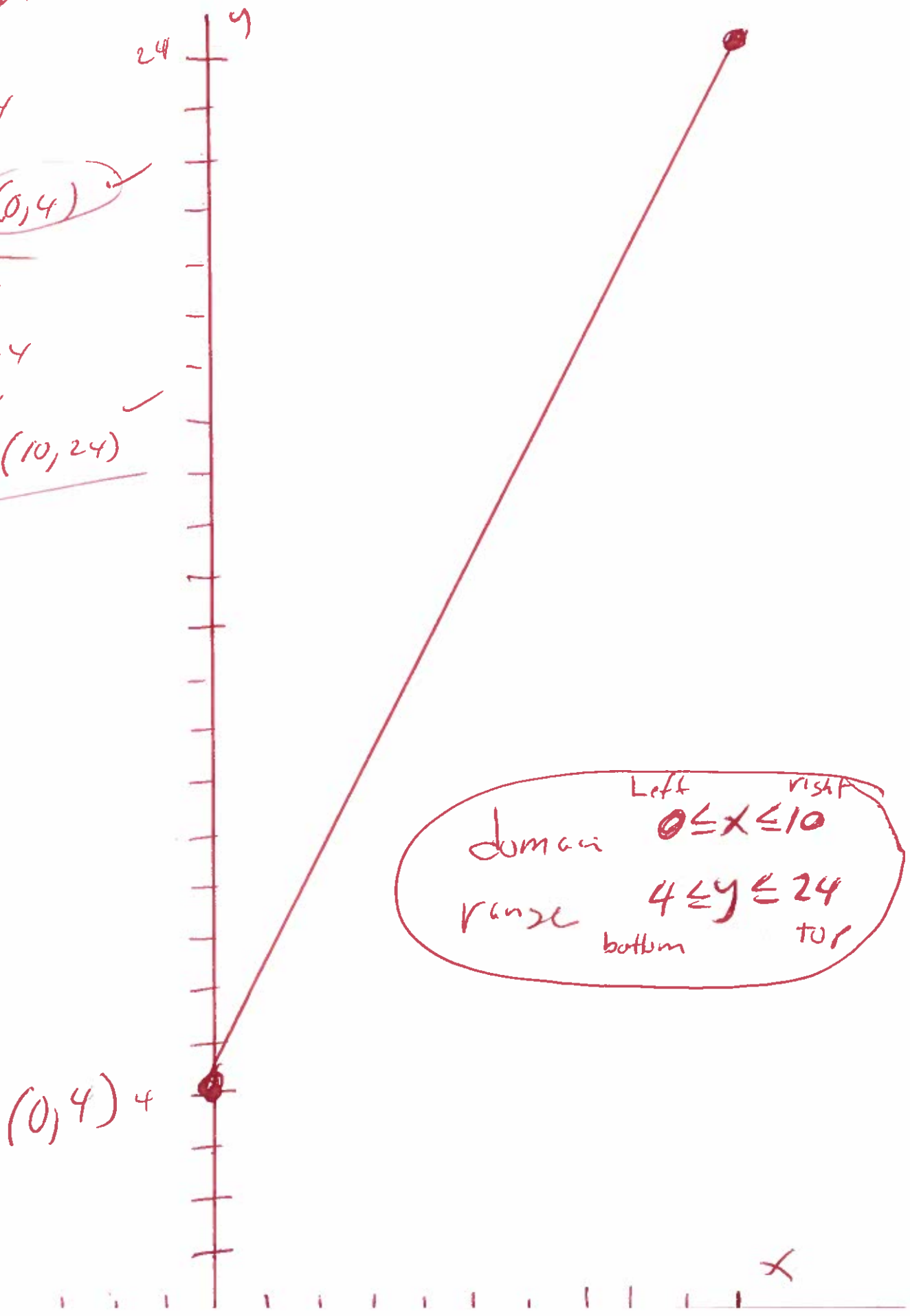
$y = 4$ $(0, 4)$ ✓

$y = 2x + 4$

$y = 2(10) + 4$

$y = 20 + 4$ ✓

$y = 24$ $(10, 24)$



domain Left $0 \le x \le 10$ right

range $4 \le y \le 24$

bottom top

59. $y = x^2$

$y = -\left(\frac{x}{3}\right)^2$

Solve by Graphing

$y = x^2$

$y = (-1)^2$

$y = (-1)(-1)$

$y = 1$ ✓

$y = (0)^2$

$y = (0)(0)$

$y = 0$ ✓

$y = (1)^2$

$y = (1)(1)$

$y = 1$ ✓

$y = -\left(\frac{x}{3}\right)^2$

$y = -\left(\frac{-3}{3}\right)^2$

$y = -(-1)^2$

$y = -(-1)(-1)$

$y = -(1)$

$y = -1$ ✓

$y = -\left(\frac{0}{3}\right)^2$

$y = -(0)^2$

$y = -(0)(0)$

$y = -(0)$

$y = 0$ ✓

$y = -\left(\frac{3}{3}\right)^2$

$y = -(1)^2$

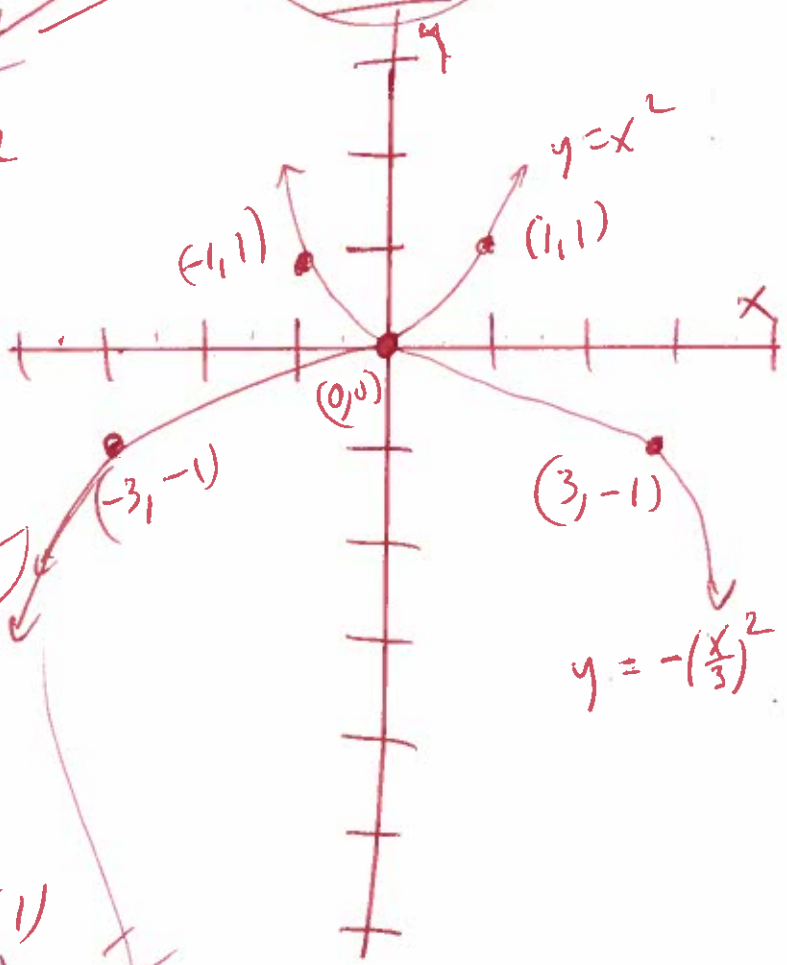
$y = -(1)(1)$

$y = -(1)$

$y = -1$ ✓

x	y
-1	1
0	0
1	1

x	y
-3	-1
0	0
3	-1



Intersect at (0,0) ✓

(60) $(25x^6y^8z^{20})^{1/2} =$ Simplify

$(5^2x^6y^8z^{20})^{1/2} =$

$5^{2(\frac{1}{2})}x^{6(\frac{1}{2})}y^{8(\frac{1}{2})}z^{20(\frac{1}{2})} =$ Mult Powers

$5^{\frac{2}{1}(\frac{1}{2})}x^{\frac{6}{1}(\frac{1}{2})}y^{\frac{8}{1}(\frac{1}{2})}z^{\frac{20}{1}(\frac{1}{2})} =$

$5^{\frac{2}{2}}x^{\frac{6}{2}}y^{\frac{8}{2}}z^{\frac{20}{2}} =$

$5^1x^3y^4z^{10} =$

$5x^3y^4z^{10} =$

61. $|x+1| > 4$ Solve

formula

$|x| > a$

$x < -a$ OR $x > a$

$x+1 < -4$ OR $x+1 > 4$

$x+1-1 < -4-1$ OR $x+1-1 > 4-1$

$x < -5$ OR $x > 3$

$(-\infty, -5) \cup (3, \infty)$

(62) $x+y=1300$ Solve system

$10x+5y=9000$

$(1x+1y=1300)\ (-5)$ Mult

$(10x+5y=9000)\ (1)$

$-5x-5y=-6500$

$10x+5y=9000$

$5x+0=2500$

$5x=2500$

$\frac{5x}{5}=\frac{2500}{5}$

$x=500$

Subst

$x+y=1300$

$(500)+y=1300$

$500+y=1300$

$500+y-500=1300-500$

$y=800$

$(x, y)=(500, 800)$

(63) $2x+3y=3400$

$5x+2y=4400$

$(2x+3y=3400)(-2)$ Mult

$(5x+2y=4400)(3)$

$-4x-6y=-6800$

$15x+6y=12300$

$11x+0=5500$

$11x=5500$

$\frac{11x}{11}=\frac{5500}{11}$

$x=500$

Subst

$2x+3y=3400$

$2(500)+3y=3400$

$1000+3y=3400$

$1000+3y-1000=3400-1000$

$3y=2400$

$\frac{3y}{3}=\frac{2400}{3}$

$y=800$

$(x, y)=(500, 800)$