

$$(1) (-17 - 31) \div 16 - 23 =$$

$$(-48) \div 16 - 23 =$$

$$-3 - 23 =$$

$$-26 =$$

Math 041037 Step

06-30-18

day
day
day
day

$$(2) 4(y - 2) = y - 8$$

$$4y - 8 = y - 8$$

$$4y - 8 + 8 = y - 8 + 8$$

$$4y = y$$

$$4y = 1y$$

$$4y - 1y = 1y - 1y$$

$$3y = 0$$

$$\frac{3y}{3} = \frac{0}{3}$$

$$y = 0$$

(3)

$$5(4x - 2) = 21x$$

$$20x - 10 = 21x$$

$$20x - 10 + 10 = 21x + 10$$

$$20x = 21x + 10$$

$$20x - 21x = 21x + 10 - 21x$$

$$-1x = 10$$

$$\frac{-1x}{-1} = \frac{10}{-1}$$

$$x = -10$$

(4)

$$\frac{1}{4} - \frac{5}{18} = \text{Primes } 2, 3, 5, 7, \dots$$

$$\frac{1}{4} \left(\frac{9}{9} \right) - \frac{5}{18} \left(\frac{2}{2} \right) =$$

$$\frac{9}{36} - \frac{10}{36} =$$

$$\frac{(9) - (10)}{36} =$$

$$\frac{9 - 10}{36} =$$

$$\frac{-1}{36} =$$

$$\begin{array}{r} 2 \overline{) 4} \\ 2 \overline{) 2} \\ 1 \end{array} \quad \begin{array}{r} 2 \overline{) 18} \\ 3 \overline{) 9} \\ 3 \overline{) 3} \\ 1 \end{array}$$

$$4 = 2 \cdot 2$$

$$18 = 2 \cdot 3 \cdot 3$$

$$\begin{array}{l} \text{LCD} = 2 \cdot 2 \cdot 3 \cdot 3 \\ = 36 \end{array}$$

$$(5) \quad \frac{z}{5} = \frac{z}{4} + 9$$

$$L(1) = 20$$

$$\frac{z}{5}(20) = \frac{z}{4}(20) + \frac{9}{1}(20) \quad \text{mult}$$

$$z(4) = z(5) + 9(20) \quad \text{divide numbers}$$

$$4z = 5z + 180$$

$$4z - 5z = \cancel{5z} + 180 - \cancel{5z}$$

$$-1z = 180$$

$$\frac{-1z}{-1} = \frac{180}{-1}$$

$$z = -180$$

$$(6) \quad 4.9x - 68 = 2.9x + 2$$

$$4.9x - \cancel{68} + \cancel{68} = 2.9x + 2 + 68$$

$$4.9x = 2.9x + 70$$

$$4.9x - 2.9x = \cancel{2.9x} + 70 - \cancel{2.9x}$$

$$2x = 70$$

$$\frac{2x}{2} = \frac{70}{2}$$

$$x = 35$$

⑦ $A = P - PD$, $P = \$509$, $D = 30\% = .30$ 4

$$A = \$509 - 509(.30)$$

$$A = \$509 - \$152.70 \leftarrow \text{Discount}$$

$$A = \$356.30 \leftarrow \text{Sale price}$$

⑧ $A = P + PRT$, $P = \$79000$, $R = 7.5\% = .075$
 $T = 2$

$$A = \$79000 + \$79000(.075)(2)$$

$$A = \$79000 + \$79000(.15)$$

$$A = \$79000 + \$11850 \leftarrow \text{Interest paid on loan}$$

$$A = \$90,850 \leftarrow \text{Total amount paid}$$

9. $7(x-9) - 3 = -66$

$$7x - 63 - 3 = -66$$

$$7x - 66 = -66$$

$$7x - \cancel{66} + \cancel{66} = -66 + 66$$

$$7x = 0$$

$$\frac{7x}{7} = \frac{0}{7}$$

$$x = 0$$

10. $2(6x+5) = 12x+10$

$$12x + 10 = 12x + 10$$

$$12x + \cancel{10} - \cancel{10} = 12x + \cancel{10} - \cancel{10}$$

$$12x = 12x$$

$$12x - 12x = 12x - 12x$$

$$0 = 0$$

The solution is all real numbers

11 $9x + y = 6$

$y =$

$$\cancel{9x} + y - \cancel{9x} = 6 - 9x$$

$$y = 6 - 9x$$

OR

$$y = -9x + 6$$

12. $-8x + 4 \geq 4(4 - x)$

$$-8x + 4 \geq 16 - 4x$$

$$-8x + \cancel{4} - \cancel{4} \geq 16 - 4x - 4$$

$$-8x \geq -4x + 12$$

$$-8x + 4x \geq -\cancel{4}x + 12 + 4x$$

$$-4x \geq 12$$

$$\frac{-4x}{-4} \leq \frac{12}{-4}$$

$$x \leq -3$$



$$(-\infty, -3]$$

(13) $y = -3x + 3$ graph

$$y = -3(0) + 3$$

$$y = 0 + 3$$

$$y = 3$$

$$y = -3(1) + 3$$

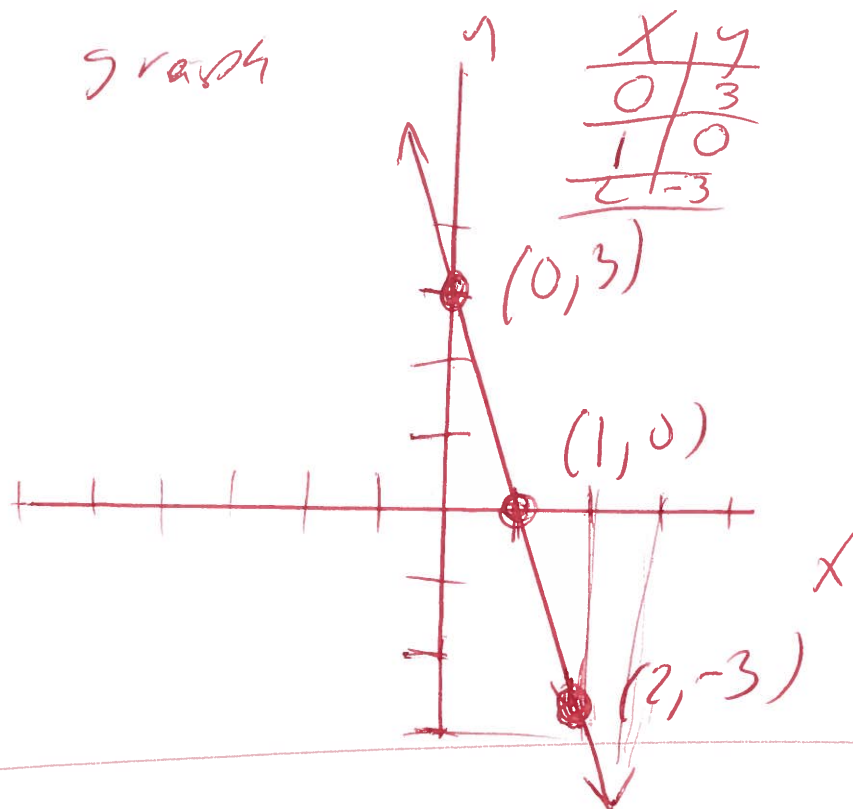
$$y = -3 + 3$$

$$y = 0$$

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

$$y = -6 + 3$$

$$y = -3$$



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

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

$$y = 0 + 1$$

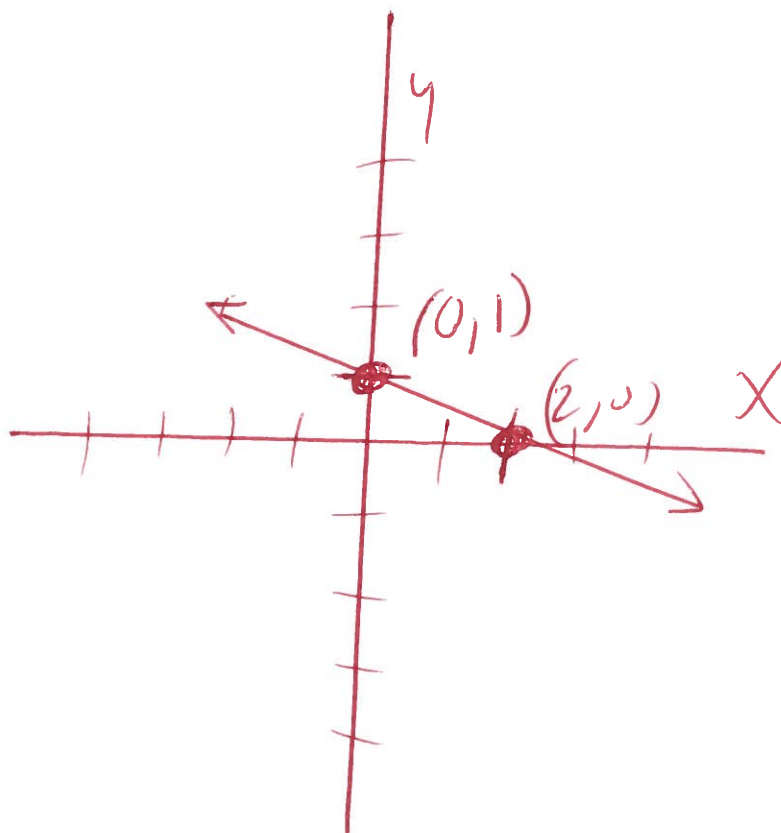
$$y = 1$$

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

$$y = -1 + 1$$

$$y = 0$$

x	y
0	1
2	0



(15) $6x - 3y = -6$ graph
find x -intercept let $y = 0$

$$6x - 3(0) = -6$$

$$6x - 0 = -6$$

$$6x = -6$$

$$\frac{6x}{6} = \frac{-6}{6}$$

$$x = -1 \quad (-1, 0)$$

$$6x - 3y = -6$$

find y -intercept let $x = 0$

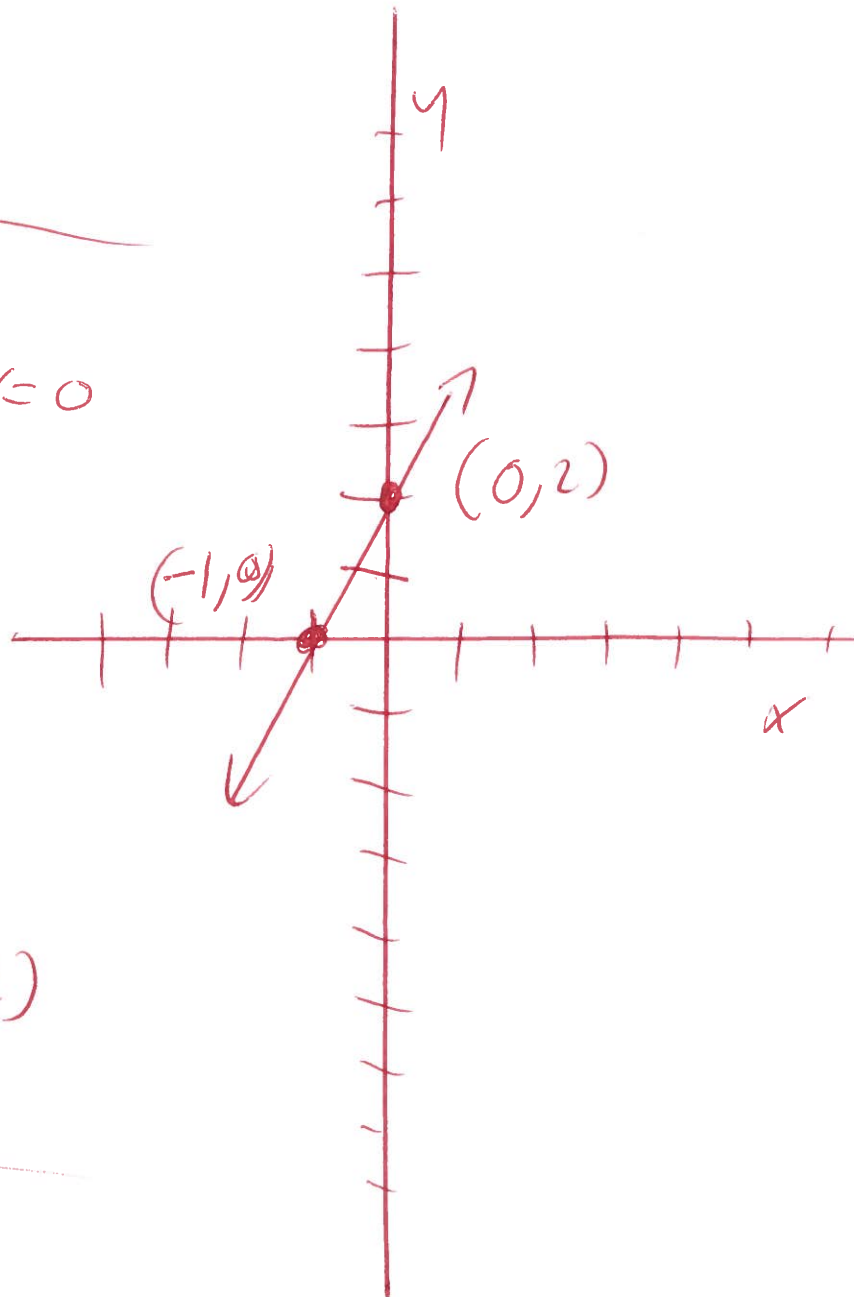
$$6(0) - 3y = -6$$

$$0 - 3y = -6$$

$$-3y = -6$$

$$\frac{-3y}{-3} = \frac{-6}{-3}$$

$$y = 2 \quad (0, 2)$$



(16) $(-2, -6)$ and $(-7, -2)$ find slope

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

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

$$m = \frac{(-6) - (-2)}{(-2) - (-7)}$$

$$m = \frac{-6 + 2}{-2 + 7}$$

$$m = \frac{-4}{5}$$

(17) $7x + y = 3$ find slope

$$7x + y - 7x = 3 - 7x$$

$$y = 3 - 7x$$

$$y = -7x + 3$$

$$\text{Slope} = -7 = m$$

$$y\text{-intercept} = 3$$

formula

$$y = mx + b$$

$$\text{Slope} = m$$

$$y\text{-intercept} = b$$

18.

$$2x - 3y = 6$$

find slope

10

$$2x - 3y - 2x = 6 - 2x$$

$$-3y = 6 - 2x$$

$$\frac{-3y}{-3} = \frac{6}{-3} - \frac{2x}{-3}$$

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

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

formula

$$y = mx + b$$

Slope = m

y-intercept = b

$$\text{Slope} = \frac{2}{3} = m$$

$$\text{y-intercept} = -2$$

19.

Determine whether the pair of lines are parallel, perpendicular, or neither

$$y = \frac{3}{5}x + 8 \quad m_1 = \frac{3}{5}$$

$$y = -\frac{3}{5}x \quad m_2 = -\frac{3}{5}$$

$$m_1 = \frac{3}{5} \neq -\frac{3}{5} = m_2 \quad \text{Not Parallel}$$

$$m_1 = \frac{3}{5}, m_2 = -\frac{3}{5}, m_1 \cdot m_2 = \left(\frac{3}{5}\right)\left(-\frac{3}{5}\right) = \frac{-9}{25} \neq -1$$

Not Perpendicular

Neither

(20) $m=4$, $(-7, 11)$ find equation of the line
 x_1, y_1

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

$$y - (11) = 4(x - (-7))$$

$$y - 11 = 4(x + 7)$$

$$y - 11 = 4x + 28$$

$$y - \cancel{11} + \cancel{11} = 4x + 28 + 11$$

$$y = 4x + 39$$

(21) $m=-6$, y-intercept $(0, 7)$
 x_1, y_1 find equation of the line

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

$$y - (7) = -6(x - (0))$$

$$y - 7 = -6(x - 0)$$

$$y - 7 = -6(x)$$

$$y - 7 = -6x$$

$$y - \cancel{7} + \cancel{7} = -6x + 7$$

$$y = -6x + 7$$

21

$$\begin{aligned}2x - y &= 1 \\ x + 3y &= 18\end{aligned}$$

Is $(3, 5)$ a solution? 12
 $x \quad y$

$$2(3) - (5) = 1$$

$$6 - 5 = 1$$

$$1 = 1 \quad \checkmark \quad \text{yes}$$

Yes $(3, 5)$ is a solution

$$(3) + 3(5) = 18$$

$$3 + 15 = 18$$

$$18 = 18 \quad \checkmark \quad \text{yes}$$

$$\begin{aligned}2x - y &= 1 \\ x + 3y &= 18\end{aligned}$$

Is $(5, 9)$ a solution?
 $x \quad y$

$$2(5) - (9) = 1$$

$$10 - 9 = 1$$

$$1 = 1 \quad \checkmark \quad \text{yes}$$

No $(5, 9)$ is
not a solution

$$(5) + 3(9) = 18$$

$$5 + 27 = 18$$

$$32 \neq 18 \quad \text{no}$$

23.

$$6x + y = 32$$

$$2x - y = 8$$

$$\hline 8x + 0 = 40$$

$$8x = 40$$

$$\frac{8x}{8} = \frac{40}{8}$$

$$x = 5$$

Subst

$$6x + y = 32$$

$$6(5) + y = 32$$

$$30 + y = 32$$

$$\cancel{30} + y - \cancel{30} = 32 - 30$$

$$y = 2$$

$$(x, y) = (5, 2)$$

24. $P(x) = x^2 + x + 4$ find $P(7)$

$$P(7) = (7)^2 + (7) + 4$$

$$P(7) = (7)(7) + (7) + 4$$

$$P(7) = 49 + 7 + 4$$

$$P(7) = 56 + 4$$

$$P(7) = 60$$

25. $(5y^2 + 5y - 3) - (-9y + 2) =$

$$5y^2 + 5y - 3 + 9y - 2 =$$

$$5y^2 + 14y - 5 =$$

26. $(-6y^2 - 8y) + (3y^2 + y - 1) =$

$$-6y^2 - 8y + 3y^2 + y - 1 =$$

$$-3y^2 - 7y - 1 =$$

27.

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

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

$$9y^2 - 18y - 18y + 36 =$$

$$9y^2 - 36y + 36 =$$

28.

$$(5x-8)(3x-7) =$$

$$15x^2 - 35x - 24x + 56 =$$

$$15x^2 - 59x + 56 =$$

29.

$$(x+2)(x^3-4x+5) =$$

$$x^4 - 4x^2 + 5x + 2x^3 - 8x + 10 =$$

$$x^4 + 2x^3 - 4x^2 - 3x + 10 =$$

30.

$$(7a+4)(4a^2-6a-9) =$$

$$28a^3 - 42a^2 - 63a + 16a^2 - 24a - 36 =$$

$$28a^3 - 26a^2 - 87a - 36 =$$

$$\begin{aligned} (31.) \quad (7p+q)(7p-q) &= \\ 49p^2 - 7pq + 7pq - q^2 &= \\ 49p^2 - q^2 &= \end{aligned}$$

$$\begin{aligned} (32.) \quad (10x-3)(2x+7) &= \\ 20x^2 + 70x - 6x - 21 &= \\ 20x^2 + 64x - 21 &= \end{aligned}$$

$$\begin{aligned} (33.) \quad &\left(\frac{x^{-3}y^5}{x^4y^7} \right)^3 \\ &\left(\frac{y^5}{x^4x^3y^7} \right)^3 = \text{rewrite without negative powers} \\ &\left(\frac{1}{x^{4+3}y^{7-5}} \right)^3 = \\ &\left(\frac{1}{x^7y^2} \right)^3 = \\ &\frac{(1)^3}{x^{7(3)}y^{2(3)}} = \end{aligned}$$

$\begin{aligned} &\downarrow \frac{1^3}{x^{21}y^6} = \\ &\downarrow \frac{1 \cdot 1 \cdot 1}{x^{21}y^6} = \\ &\frac{1}{x^{21}y^6} = \end{aligned}$

$$\textcircled{34} \frac{(-3xy^{-2})^{-3}}{(xy^{-2})^{-1}} =$$

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

$$\frac{(-3)^{1(-3)} x^{1(-3)} y^{-2(-3)}}{x^{1(-1)} y^{-2(-1)}} = \text{Mult}$$

$$\frac{(-3)^{-3} x^{-3} y^6}{x^{-1} y^2} =$$

$$\frac{x^1 y^6}{(-3)^3 x^3 y^2} =$$

$$\frac{(-3)(-3)(-3) x^{3-1}}{y^{6-2}} =$$

$$\frac{y^4}{-27x^2} = \text{OR}$$

$$= \frac{y^4}{27x^2}$$

35.

$$(7x^2 + 11x + 11) \div (x+1)$$

18

$$\frac{7x^2 + 11x + 11}{x+1} = \text{rewrite}$$

$$\begin{array}{r} x+1 \overline{) 7x^2 + 11x + 11} \\ \underline{-(7x^2 + 7x)} \\ 4x + 11 \\ \underline{-(4x + 4)} \\ 7 \text{ rem} \end{array}$$

Use Long division

$$\begin{array}{r} \text{odd } x+1 \\ -1 \overline{) 7 \quad 11 \quad 11} \\ \underline{-7 \quad -4} \\ 7 \quad 4 \quad 7 \text{ Rem} \end{array}$$

Use Synthetic division

$$7x + 4 + \frac{7}{x+1}$$

36. $49x^2 - 36y^2$ factors

$$(7x)^2 - (6y)^2$$

$$(7x+6y)(7x-6y)$$

formula

$$a^2 - b^2$$

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

37.

$$x^2 - 12x + 27 = 0$$

$$(x-3)(x-9) = 0$$

possibly

$$27, 1$$

$$3, 9$$

or $x-3=0$ or $x-9=0$

$$x - \cancel{3} + \cancel{3} = 0 + 3 \quad \text{or} \quad x - \cancel{9} + \cancel{9} = 0 + 9$$

$$x = 3$$

$$\text{or } x = 9$$

answer

$$\{3, 9\}$$