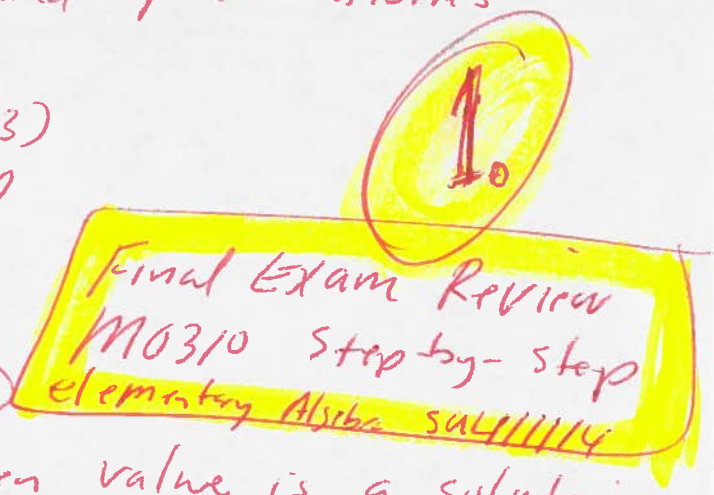
1. Determine whether the ordered pair satisfies the equation.

$5x+2y=26$ $\quad (4, 3)$ $\quad x\ y$

$5(4)+2(3)=26$

$20+6=26$

$26=26$ YES




2. Determine if the given value is a solution to the equation.

$8x-10=15$ $\quad x=3$

$8(3)-10=15$

$24-10=15$

$14 \neq 15$

NO

3. $-7x-7=1+9x$

$-7x-\cancel{1}+\cancel{1}=1+9x+7$

$-7x=9x+8$

$-7x-9x=\cancel{9x}+8-\cancel{9x}$

$-16x=8$

$\frac{-\cancel{16}x}{\cancel{-16}}=\frac{8}{-16}$

$x=-\frac{\cancel{8}(1)}{\cancel{8}(2)}$

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

(4.) $3x-8=4(x+1)$

$3x-8=4x+4$

$3x-8+8=4x+4+8$

$3x=4x+12$

$3x-4x=4x+12-4x$

$-1x=12$

$\frac{-1x}{-1}=\frac{12}{-1}$

$x=-12$

21

(5.) $\frac{5x}{2}+3=\frac{1}{7}$ LCD = 14

$\frac{5x}{2}+\frac{3}{1}=\frac{1}{7}$

$\frac{5x}{2}(14)+\frac{3}{1}(14)=\frac{1}{7}(14)$

$5x(7)+3(14)=1(2)$

$35x+42=2$

$35x+42-42=2-42$

$35x=-40$

$\frac{35x}{35}=\frac{-40}{35}$

$x=-\frac{5(8)}{5(7)}$

$x=-\frac{8}{7}$

$14 \times 3 = 42$

6. $\frac{13}{10}x + \frac{6}{5} = \frac{6}{5}x$ LCD = 10

$\frac{13x}{10}(10) + \frac{6}{5}(10) = \frac{6x}{5}(10)$

$13x(1) + 6(2) = 6x(2)$

$13x + 12 = 12x$

$13x + 12 - 12 = 12x - 12$

$13x = 12x - 12$

$13x - 12x = 12x - 12 - 12x$

$1x = -12$

$x = -12$

3.

7. $\frac{r+6}{5} = \frac{r+8}{7}$

$7(r+6) = 5(r+8)$ Cross multiply

$7r + 42 = 5r + 40$

$7r + 42 - 42 = 5r + 40 - 42$

$7r = 5r - 2$

$7r - 5r = 5r - 2 - 5r$

$2r = -2$

$\frac{2r}{2} = \frac{-2}{2}$

$r = -1$

(8.) $-46.8 = -5.2x$

$\frac{-46.8}{-5.2} = \frac{-5.2x}{-5.2}$

$9 = x$

$5.2 \overline{)46.8.}$ $9.$

$46\,8$

$0$

4

(9.) $x + 7.1x = 234.9$

$1.0x + 7.1x = 234.9$

$8.1x = 234.9$

$\frac{8.1x}{8.1} = \frac{234.9}{8.1}$

$x = 29$

$8.1 \overline{)234.9.}$ $29.$

$162$

$729$

$729$

$0$

(10.) $-7x + 5 + 5x = -2x + 10$

$-2x + 5 = -2x + 10$

$-2x + 5 - 5 = -2x + 10 - 5$

$-2x = -2x + 5$

$-2x + 2x = -2x + 5 + 2x$

$0 \neq 5$

$\emptyset$ or $\{\}$ or contradiction

(11.) $2(x+3) = (2x+6)$

$2x + 6 = 2x + 6$

$2x + 6 - 6 = 2x + 6 - 6$

$2x = 2x$

$2x - 2x = 2x - 2x$

$0 = 0$

all real numbers or identity

(12.) $14x + 9y = 10$ Solve for $y$

$14x + 9y - 14x = 10 - 14x$

$9y = 10 - 14x$

$\frac{9y}{9} = \frac{10-14x}{9}$

$y = \frac{10-14x}{9}$

(13.) The sum of a number and three is negative eleven. Find the number.

$x + 3 = -11$

$x + 3 - 3 = -11 - 3$

$x = -14$

(14.) Six times a number, added to 18, is 36. Find the number.

$6x + 18 = 36$

$6x + 18 - 18 = 36 - 18$

$6x = 18$

$\frac{6x}{6} = \frac{18}{6}$

$x = 3$

(15.) 2 times a number less than 7 times the same number is 35. Find the number.

$7x - 2x = 35$

$5x = 35$

$\frac{5x}{5} = \frac{35}{5}$

$x = 7$

(16) $-3x > 36$

$\frac{-3x}{-3} < \frac{36}{-3}$ Turn the alligator around

$x < -12$ OR  OR $(-\infty, -12)$



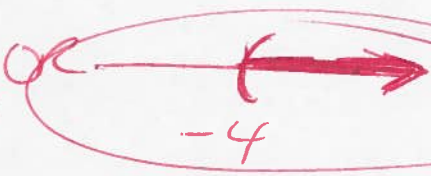
(17) $6x + 3 > 5x - 1$

$6x + 3 - 3 > 5x - 1 - 3$

$6x > 5x - 4$

$6x - 5x > 5x - 4 - 5x$

$1x > -4$

$x > -4$ OR  OR $(-4, +\infty)$



(18) $1.4x - 3.8 > 0.7x - 1.07$

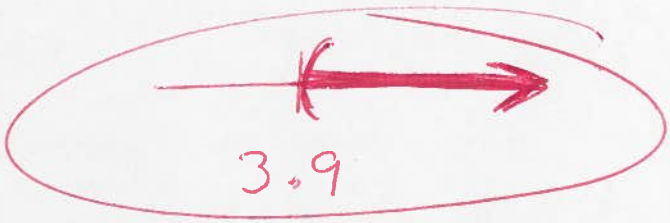
$1.4x - 3.8 + 3.8 > 0.7x - 1.07 + 3.8$

$1.4x > 0.7x + 2.73$

$1.4x - 0.7x > 0.7x + 2.73 - 0.7x$

$.7x > 2.73$

$\frac{.7x}{.7} > \frac{2.73}{.7}$

$x > 3.9$ OR  OR $(3.9, +\infty)$



$3.80 - 1.07 = 2.73$

$.7 \overline{)2.73}$ → $3.9$

$-(21)$

$63$

$-(63)$

$0$

(19) $6x-2 < 7(x-3)$

$6x-2 < 7x-21$

$6x-2+2 < 7x-21+2$

$6x < 7x-19$

$6x-7x < 7x-19-7x$

$-1x < -19$

$\frac{-1x}{-1} > \frac{-19}{-1}$ Turn the allisator around

$x > 19$ OR  OR $(19, +\infty)$

(20) $35x+35 > 5(6x+6)$

$35x+35 > 30x+30$

$35x+35-35 > 30x+30-35$

$35x > 30x-5$

$35x-30x > 30x-5-30x$

$5x > -5$

$\frac{5x}{5} > \frac{-5}{5}$

$x > -1$ OR  OR $(-1, +\infty)$

(21) $5-3(1-x) \leq 11$

$5-3+3x \leq 11$

$2+3x \leq 11$

$2+3x-2 \leq 11-2$

$3x \leq 9$

$\frac{3x}{3} \leq \frac{9}{3}$

$x \leq 3$ OR  OR $(-\infty, 3]$

(22.) Decide whether or not the ordered pair is a solution to the equation.

$4x+2y=16$ ? $(2,4)$
$x\ y$

$4(2)+2(4)=16$ ?

$8+8=16$ ?

$16=16$ YES

(23.) Decide whether or not the ordered pair is a solution to the equation

$3x-5y=35$ ? $(5,4)$
$x\ y$

$3(5)-5(4)=35$ ?

$15-20=35$ ?

$-5 \neq 35$ NO

(24.) Find an ordered pair that satisfies the equation $y=-x+9$ by letting $x=5$.

$y=-(5)+9$

$y=-5+9$

$y=4$

$(x,y)=(5,4)$

(25) Find an ordered pair that satisfies the equation $4x+y=-34$ by letting $x=-9$.

$4(-9)+y=-34$

$-36+y=-34$

$-36+y+36=-34+36$

$y=2$

9

$(x,y)=(-9,2)$

(26) Graph $y=2x-3$

$y=2(0)-3$

$y=0-3$

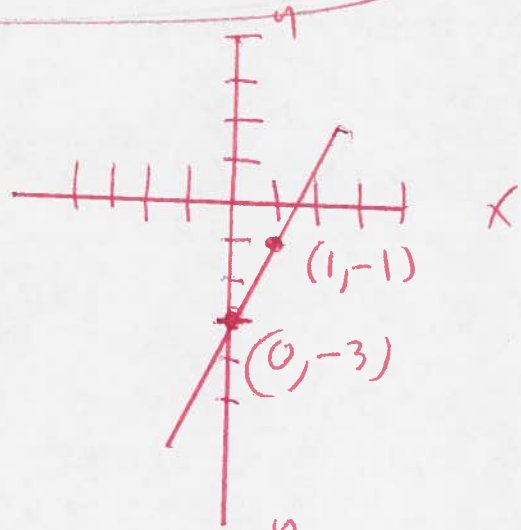
$y=-3$

$y=2(1)-3$

$y=2-3$

$y=-1$

| x | y |
|---|---|
| 0 | -3 |
| 1 | -1 |




(27) Graph $y=-3x-6$

$y=-3(0)-6$

$y=0-6$

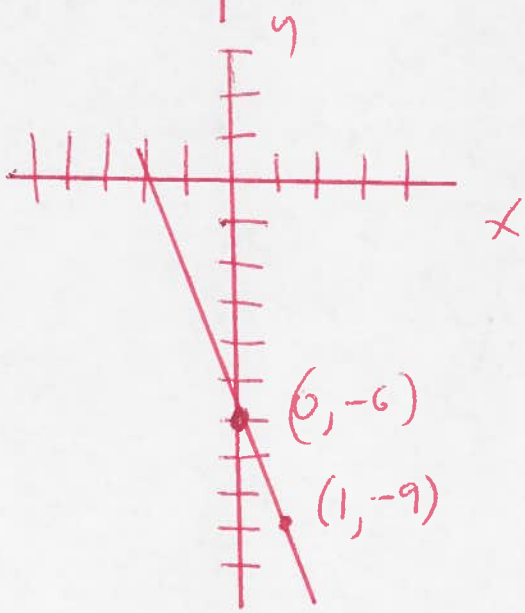
$y=-6$

$y=-3(1)-6$

$y=-3-6$

$y=-9$

| x | y |
|---|---|
| 0 | -6 |
| 1 | -9 |



(28) Graph $-5x-10y=30$

$-5x-10y+5x=30+5x$

$-10y=30+5x$

$\frac{-10y}{-10}=\frac{30}{-10}+\frac{5x}{-10}$

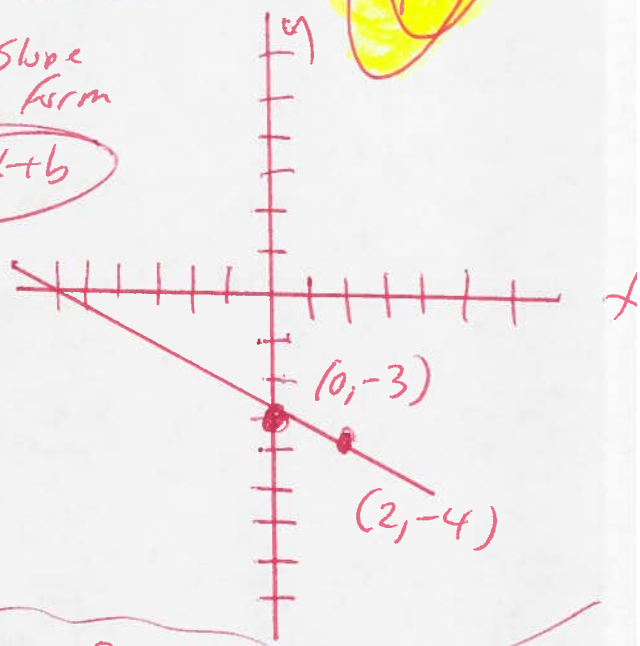
$y=-3-\frac{1}{2}x$

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

Use slope intercept form $y=mx+b$

| x | y |
|---|---|
| 0 | -3 |
| 2 | -4 |

10.




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

$y=0-3$

$y=-3$

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

$y=-1-3$

$y=-4$

OR

Graph $-5x-10y=30$

Use intercepts

Let $x=0$ Find y-intercept

$-5(0)-10y=30$

$0-10y=30$

$-10y=30$

$\frac{-10y}{-10}=\frac{30}{-10}$

$y=-3$

$(x,y)=(0,-3)$

Let $y=0$ to find x-intercept

$-5x-10(0)=30$

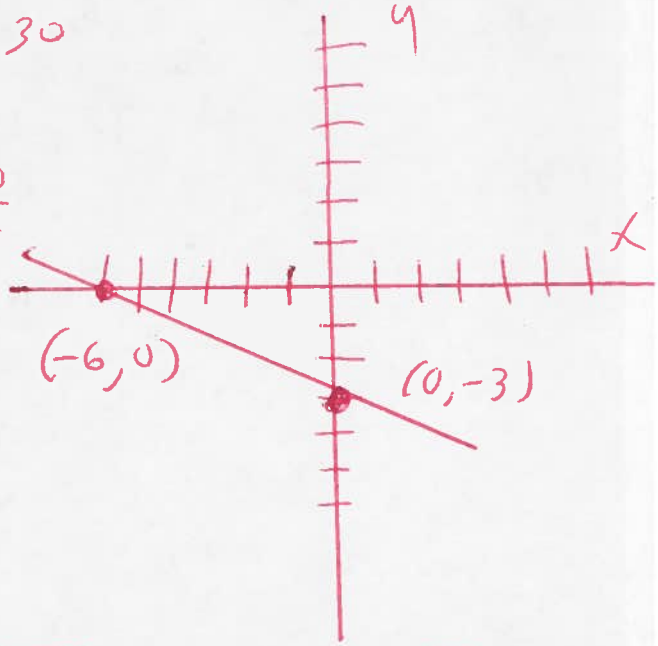
$-5x-0=30$

$-5x=30$

$\frac{-5x}{-5}=\frac{30}{-5}$

$x=-6$

$(-6,0)$



(29.) Find the slope of the line containing the two points $(1, -5)$ $(-9, 6)$.

$x_1$ $y_1$ $x_2$ $y_2$

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

$$m = \frac{(-5) - (6)}{(1) - (-9)}$$

$$m = \frac{-5 - 6}{1 + 9}$$

$$m = \frac{-11}{10}$$

(30) Find the slope and the y-intercept

$y = 3x + 11$

$y = mx + b$

slope y-intercept

Slope $= m = 3$ and y-intercept $= b = 11$

(31.) Find the slope and the y-intercept

$3x + y = 4$

$3x + y - 3x = 4 - 3x$

$y = 4 - 3x$

$y = mx + b$

slope y-intercept

$y = -3x + 4$

Slope $= m = -3$ and y-intercept $= b = 4$

(32) Find the slope and the y-intercept.

$7x - 3y = -11$

$-7x - 3y - 7x = -11 - 7x$

$-3y = -11 - 7x$

$\frac{-3y}{-3} = \frac{-11}{-3} - \frac{7x}{-3}$

$y = \frac{11}{3} + \frac{7x}{3}$

$y = \frac{7x}{3} + \frac{11}{3}$

$y = mx + b$ (m: slope, b: y-intercept)

Slope $= m = \frac{7}{3}$ and y-intercept $= b = \frac{11}{3}$

(33) Graph $y = \frac{1}{2}x + 5$

| x | y |
|---|---|
| 0 | 5 |
| 2 | 6 |

$y = \frac{1}{2}(0) + 5$

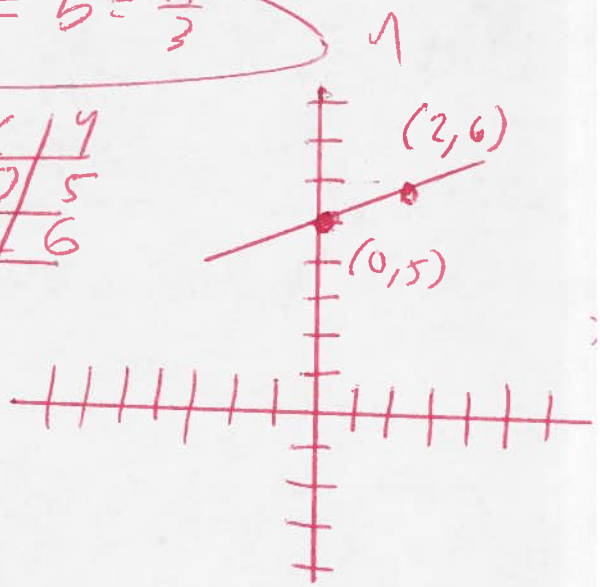
$y = 0 + 5$

$y = 5$

$y = \frac{1}{2}(2) + 5$

$y = 1 + 5$

$y = 6$




(34) Graph $7x + 2y = 14$

$7x + 2y - 7x = 14 - 7x$

$2y = 14 - 7x$

$\frac{2y}{2} = \frac{14}{2} - \frac{7x}{2}$

$y = 7 - \frac{7}{2}x$

$y = -\frac{7}{2}x + 7$

| x | y |
|---|---|
| 0 | 7 |
| 2 | 0 |

$y = -\frac{7}{2}(0) + 7$

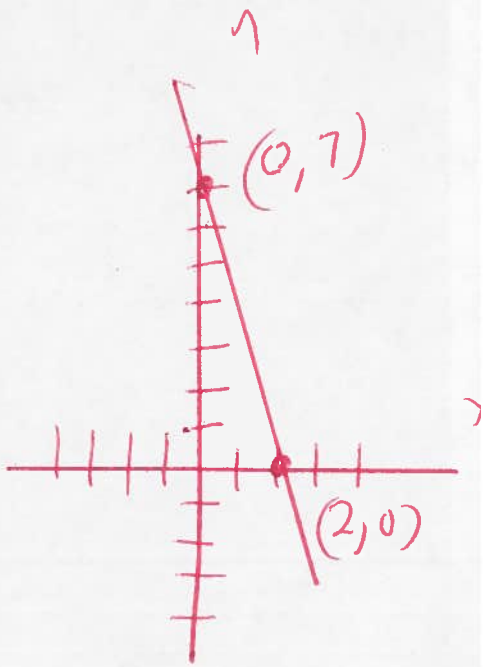
$y = 0 + 7$

$y = 7$

$y = -\frac{7}{2}(2) + 7$

$y = -7 + 7$

$y = 0$



(35) Find the equation of the line with the given slope and intercept.

slope $= m = -8$ and y-intercept $= b = 2$

$y = mx + b$ ← slope intercept form

$y = -8x + 2$

13

(36.) Find the equation of the line in slope-intercept form.

point $= (4, 3)$ and slope $= -3 = m$

$x_1$ $y_1$

point slope formula

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

$y - (3) = -3(x - (4))$

$y - 3 = -3(x - 4)$

$y - 3 = -3x + 12$

$y - 3 + 3 = -3x + 12 + 3$

$y = -3x + 15$

(37.) Determine if the lines are parallel, perpendicular, or neither

(Line1) $y = x - 6$

(Line2) $y = 2 - x$

rewrite

slope

$y = x - 1$ $m_1 = 1$ since $y = 1x - 1$

slope

$y = -x + 2$ $m_2 = -1$ since $y = -1x + 2$

since $m_1 \cdot m_2 = (1)(-1) = -1$

Lines are perpendicular

(38) Determine if the lines are parallel, perpendicular, or neither.

Line 1 $y = 7x + 9$ $m_1 = 7$ slope

Line 2 $y = -7x - 3$ $m_2 = -7$ slope

$m_1 \cdot m_2 = (7)(-7) = 49$ not perpendicular

$m_1 = 7 \neq -7 = m_2$ NOT parallel

Lines are neither

(39) Determine if the lines are parallel perpendicular, or neither.

Line 1 $y = 7x + 5$ $m_1 = 7$ slope

Line 2 $y = -\frac{1}{7}x + 3$ $m_2 = -\frac{1}{7}$ slope

$m_1 \cdot m_2 = (7)(-\frac{1}{7}) = (\frac{7}{1})(\frac{-1}{7}) = \frac{-7}{7} = -1$

lines are perpendicular

(40) Determine if the lines are parallel perpendicular, or neither.

Line 1 $6x + 2y = 8$

Line 1 $18x + 6y = 27$

$6x + 2y = 8$

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

$2y = 8 - 6x$

$\frac{2y}{2} = \frac{8}{2} - \frac{6x}{2}$

$y = 4 - 3x$ slope $m_1 = -3$

$y = -3x + 4$

$18x + 6y = 27$

$18x + 6y - 18x = 27 - 18x$

$6y = 27 - 18x$

$\frac{6y}{6} = \frac{27}{6} - \frac{18x}{6}$

$y = \frac{9}{2} - 3x$ slope $m_2 = -3$

$y = -3x + \frac{9}{2}$

Parallel lines since $m_1 = m_2 = -$

(41) Solve (substitution)

$X+y=-6$

$y=2x$

Subst

$X+(2X)=-6$

$X+2X=-6$

$1X+2X=-6$

$3X=-6$

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

$X=-2$

Subst

$X+y=-6$

$-2+y=-6$

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

$y=-4$

$(X, y)$

$(-2, -4)$

19

(42) Solve (Elimination)

$3X+y=-30$

$5X-y=6$

$8X+0=-24$

$8X=-24$

$\frac{8X}{8}=\frac{-24}{8}$

$X=-3$

Subst

$3(-3)+y=-30$

$-9+y=-30$

$-9+y+9=-30+9$

$y=-21$

$(X, y)$

$(-3, -21)$

(43) Solve (Elimination)

$x - 4y = 17$

$-3x - 5y = 51$

$(x - 4y = 17)(-5)$ Mult

$(-3x - 5y = 51)(4)$ Mult

$-5x + 20y = -85$

$-12x - 20y = 204$

$-17x = 119$

$\frac{-17x}{-17} = \frac{119}{-17}$

$x = -7$

Subst (16)

$x - 4y = 17$

$(-7) - 4y = 17$

$-7 - 4y = 17$

$-7 + 7 - 4y = 17 + 7$

$-4y = 24$

$\frac{-4y}{-4} = \frac{24}{-4}$

$y = -6$

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

(44) Solve (Elimination)

$x + y = 4$

$x + y = -6$

$(x + y = 4)(-1)$ Mult

$(x + y = -6)(1)$ Mult

$-x - y = -4$

$x + y = -6$

$0 + 0 = -10$

$0 \neq -10$

$\emptyset$, $\{\}$, No Solution, Inconsistent

Simplify

(45) $(-2x^2-5x-6)+(8x^2-5x+4)=$

$-2x^2-5x-6+8x^2-5x+4=$

$6x^2-10x-2=$

Simplify

(46) $(7x^2+20x+5)-(5x^2-4x-12)=$

$7x^2+20x+5-5x^2+4x+12=$

$2x^2+24x+17=$

(47) Evaluate

$-2x^2+8x-3=$ if $x=-3$

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

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

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

$-18-24-3=$

$-42-3=$

$-45=$

Simplify

(48) $(-8x^9y^8z)^2=$

$((-8)^1x^9y^8z^1)^2=$ (Mult powers)

$(-8)^2x^{18}y^{16}z^2=$

$(-8)(-8)x^{18}y^{16}z^2=$

$64x^{18}y^{16}z^2=$

(49) Simplify $(7x^6y)(8x^2y^4) =$

$(7x^6y^1)(8x^2y^4) =$

$56x^{6+2}y^{1+4} =$

$56x^8y^5 =$


(50.) Simplify $(m^3n)^4(-4mn^6) =$

$(m^3n^1)^4(-4m^1n^6) =$

$(m^{12}n^4)(-4m^1n^6) =$

$-4m^{12+1}n^{4+6} =$

$-4m^{13}n^{10} =$

(51.) Simplify $2y^2(3y^2+3y^1-7) =$

$6y^4+6y^3-14y^2 =$

(52) Simplify $(4y-5)(4y-3) =$

$16y^2-12y-20y+15 =$

$16y^2-32y+15 =$

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

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

$y^2-5y+4 =$

(54) $(7p+9)(7p-9) =$

$49p^2 - 63p + 63p - 81 =$

$49p^2 - 81 =$

19

(55.) $(6x-11y)^2 =$

$(6x-11y)(6x-11y) =$

$36x^2 - 66xy - 66xy + 121y^2 =$

$36x^2 - 132xy + 121y^2 =$

(56) 


Square

Find area

$A = LW$

$A = (7x-10)(7x-10)$

$A = 49x^2 - 70x - 70x + 100$

$A = 49x^2 - 140x + 100$

(57) simplify

$(2y+11)(5y^2 - 2y - 9) =$

$10y^3 - 4y^2 - 18y + 55y^2 - 22y - 99 =$

$10y^3 + 51y^2 - 40y - 99 =$

(58) simplify

$\frac{56m^{20}n^{14}}{7m^{19}n^{10}} =$

$8m^{20-19}n^{14-10} =$

$8m^1n^4 =$

$8mn^4 =$

59. $\left(\frac{6t^3}{3s^4}\right)^2 =$

$\left(\frac{2t^3}{s^4}\right)^2 =$ Mult powers

$\frac{2^2 t^6}{s^8} =$

$\frac{(2)(2)t^6}{s^8} =$

$\frac{4t^6}{s^8} =$

20.

60. $9^0 =$

$1 =$ ← (Math rule)

61. $3^{-4} =$

$\frac{1}{3^4} =$ (Rewrite with positive power)

$\frac{1}{(3)(3)(3)(3)} =$

$\frac{1}{81} =$

(62) Simplify

$$\frac{24x^2+20x-11}{4x} =$$

21

$$\frac{24x^2}{4x} + \frac{20x}{4x} - \frac{11}{4x} =$$

$$6x + 5 - \frac{11}{4x} =$$

use long division

(63) Simplify

$$\frac{3m^2+17m-56}{m+8}$$

$$m+8 \overline{)\,3m^2+17m-56}$$

$3m - 7$ ← answer

$-(3m^2+24m)$

$-7m-56$

$-(-7m-56)$

$0$ rem

OR

Simplify

$$\frac{3m^2+17m-56}{m+8}$$

use synthetic division

$-8 \mid 3 \quad 17 \quad -56$

$\quad\quad -24 \quad 56$

$3 \quad -7 \quad 0$ rem

$3x - 7 =$ ← Answer

64. factor

$x^2+x-20=$

20 · 1
10 · 2
4 · 5

$(x-4)(x+5)=$

22

65 factor

$a^2-b^2=(a+b)(a-b)$

$81x^2-16y^2=$

$(9x)^2-(4y)^2=$ rewrite

$(9x+4y)(9x-4y)=$

solve

66. $5x(6x+30)=0$

Set $5x=0$ OR $6x+30=0$

$\frac{5x}{5}=\frac{0}{5}$ OR $6x+30-30=0-30$

$x=0$ OR $6x=-30$

$\frac{6x}{6}=\frac{-30}{6}$

$x=-5$

$\{0,-5\}$

67. Solve

$(y-7)(9y+26)=0$

Set $y-7=0$ OR $9y+26=0$

$y-7+7=0+7$ OR $9y-26-26=0-26$

$y=7$ OR $9y=-26$

$\frac{9y}{9}=\frac{-26}{9}$

$y=\frac{-26}{9}$

$\{7,\frac{-26}{9}\}$

(68) Solve $x^2+2x-48=0$

$(x-6)(x+8)=0$

49.1
24.1
12.4
6.8
16.3

23

$\{6, -8\}$

Let $x-6=0$ OR $x+8=0$

$x-6+6=0+6$ OR $x+8-8=0-8$

$x=6$ OR $x=-8$

(69) $x^2-17x+72=0$

72.1
36.2
9.8
18.4

$\{8, 9\}$

Let $(x-8)(x-9)=0$

$x-8=0$ OR $x-9=0$

$x-8+8=0+8$ OR $x-9+9=0+9$

$x=8$ OR $x=9$

(70) Find $f(14)$ when $f(x)=2x+12$

$f(14)=2(14)+12$

$f(14)=28+12$

$f(14)=40$

(71) Find $f(5)$ when $f(x)=-7x+6$

$f(5)=-7(5)+6$

$f(5)=-35+6$

$f(5)=-29$

(72) Find $f(3)$ when $f(x) = x^2 + 3x - 4$

24

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

$f(3) = (3)(3) + 3(3) - 4$

$f(3) = 9 + 9 - 4$

$f(3) = 18 - 4$

$f(3) = 14$

(73) Find $f(-9)$ when $f(x) = |x| - 6$

$f(-9) = |-9| - 6$

$f(-9) = 9 - 6$

$f(-9) = 3$

(74) $f(x) = \dfrac{x+5}{14x-10}$ find $f(-10)$

$f(-10) = \dfrac{(-10)+5}{14(-10)-10}$

$f(-10) = \dfrac{-10+5}{-140-10}$

$f(-10) = \dfrac{-5}{-150}$

$f(-10) = \dfrac{5}{150}$

$f(-10) = \dfrac{5(1)}{5(30)}$

$f(-10) = \dfrac{1}{30}$