① $(-17-37) \div 18-25 =$

$(-54) \div 18-25 =$

$-3-25 =$

$-28 =$

Math 041057 step 03241800

② $3(y-5) = y-15$

$3y-15 = y-15$

$3y-15+15 = y-15+15$

$3y = y$

$3y = 1y$

$3y-1y = 1y-1y$

$2y = 0$

$\frac{2y}{2} = \frac{0}{2}$

$y = 0$

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

$12x-9=13x$

$12x-9+9=13x+9$

$12x=13x+9$

$12x-13x=13x+9-13x$

$-1x=9$

$\frac{-1x}{-1}=\frac{9}{-1}$

$x=-9$

(4) $\frac{1}{4}-\frac{5}{18}=$

Primes 2, 3, 5, 7, ...

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

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

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

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

2 | 4
2 | 2
1

$4=2\cdot 2$

2 | 18
3 | 9
3 | 3
1

$18=2\cdot 3\cdot 3$

$LCD=2\cdot 2\cdot 3\cdot 3$

$=36$

5. $\frac{y}{6} = \frac{y}{7} + 3$ LCD = 42 mult

$\frac{y}{6}(42) = \frac{y}{7}(42) + \frac{3}{1}(42)$

$y(7) = y(6) + 3(42)$

$7y = 6y + 126$

$7y - 6y = 6y + 126 - 6y$

$1y = 126$

$y = 126$

6. $4.1x - 73 = 2.6x + 5$

$4.1x - 73 + 73 = 2.6x + 5 + 73$

$4.1x = 2.6x + 78$

$4.1x - 2.6x = 2.6x + 78 - 2.6x$

$1.5x = 78$

$\frac{1.5x}{1.5} = \frac{78}{1.5}$

$x = 52$

7. $A = P - PD$ $P = \$939$, $D = 5\% = .05$

$A = \$939 - 939(.05)$

$A = \$939 - \$46.95$

$A = \$892.05$

discount

8. $A = A + PRT$, $P = \$7{,}000$, $R = 13.5\% = .135$, $T = 2$

$A = \$7{,}000 + \$7{,}000(.135)(2)$

$A = \$7{,}000 + \$7{,}000(.27)$

$A = \$7{,}000 + \$1{,}890$

interest

$A = \$90{,}170$

9. $7(x-2)-4=-18$

$7x-14-4=-18$

$7x-18=-18$

$7x-18+18=-18+18$

$7x=0$

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

$x=0$

10. $7(4x-3)=28x-21$

$28x-21=28x-21$

$28x-21+21=28x-21+21$

$28x=28x$

$28x-28x=28x-28x$

$0=0$

The solution is all real numbers.

11. $\frac{x}{5} + 4 = \frac{x}{5}$ LCD = 5

Mult

$\frac{x}{5}(5) + \frac{4}{1}(5) = \frac{x}{5}(5)$

$x(1) + 4(5) = x(1)$

$x + 20 = x$

$x + 20 - 20 = x - 20$

$x = x - 20$

$x - x = x - 20 - x$

$0 \neq -20$

There is no solution.

12. $6x + 1 = 6(x - 9)$

$6x + 1 = 6x - 54$

$6x + 1 - 1 = 6x - 54 - 1$

$6x = 6x - 55$

$6x - 6x = 6x - 55 - 6x$

$0 \neq -55$

There is no solution.

13. $x+y=5$ Solve for y

$x+y-x=5-x$

$y=5-x$

or

$y=-x+5$ Rewrite

14. $-6x+4 \geq 2(5-2x)$

$-6x+4 \geq 10-4x$

$-6x+4-4 \geq 10-4x-4$

$-6x \geq -4x+6$

$-6x+4x \geq -4x+6+4x$

$-2x \geq 6$

$\frac{-2x}{-2} \leq \frac{6}{-2}$

Divide by a negative. Turn the alligator around

$x \leq -3$

$(-\infty, -3]$

15. $y = -4x + 1$

$y = -4(0) + 1$

$y = 0 + 1$

$y = 1$

$y = -4(1) + 1$

$y = -4 + 1$

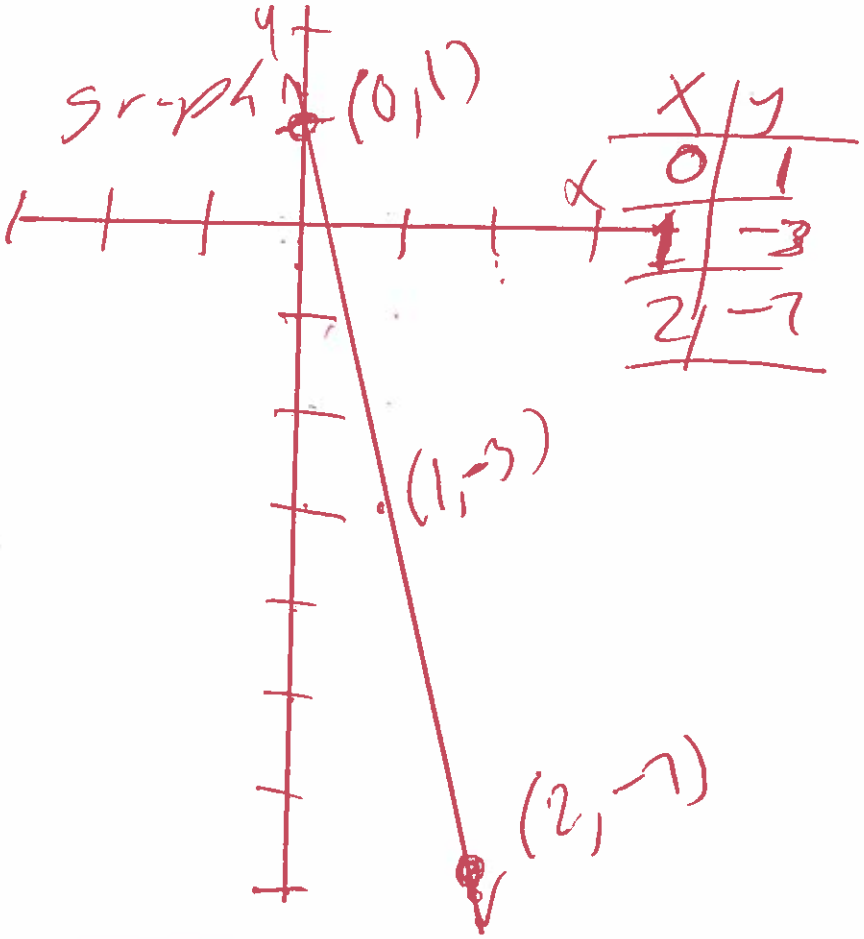
$y = -3$

$y = -4(2) + 1$

$y = -8 + 1$

$y = -7$

graph



x	y
0	1
1	-3
2	-7

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

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

$y = 0 + 2$

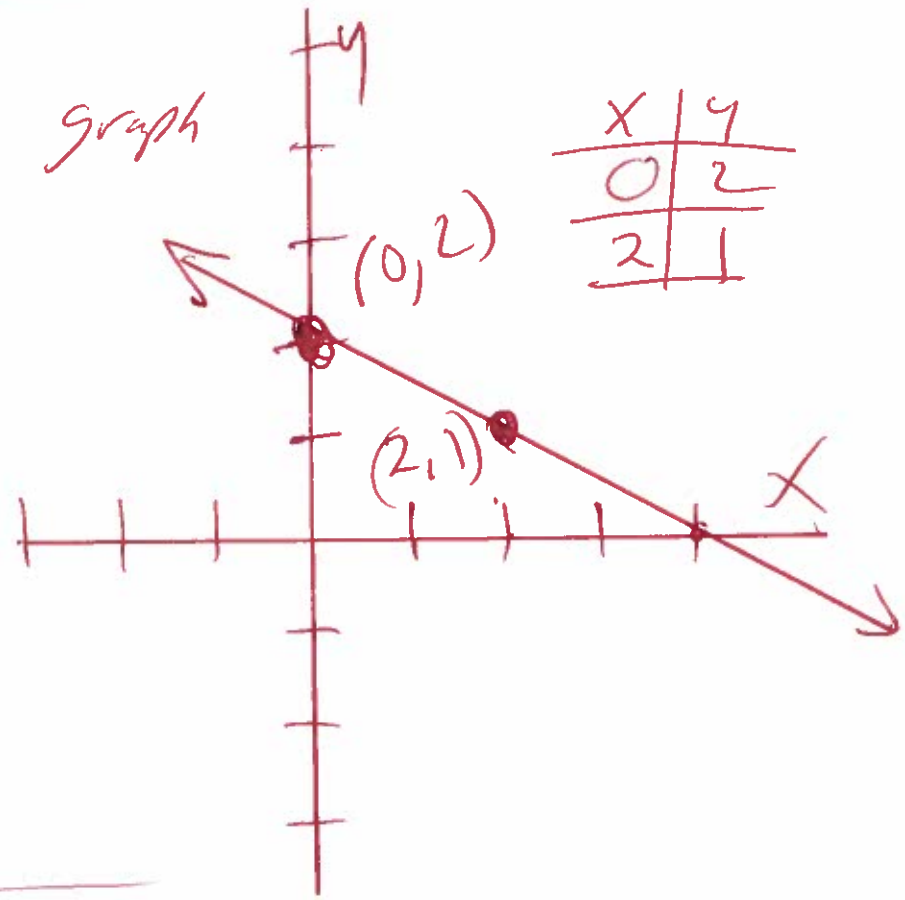
$y = 2$

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

$y = -1 + 2$

$y = 1$

graph



x	y
0	2
2	1

17. $3x - 6y = 6$ graph

$-3x \quad -3x$

$-6y = 6 - 3x$

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

$y = -1 + \frac{3}{6}x$

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

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

form $y = mx + b$

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

x	y
0	-1
2	0

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

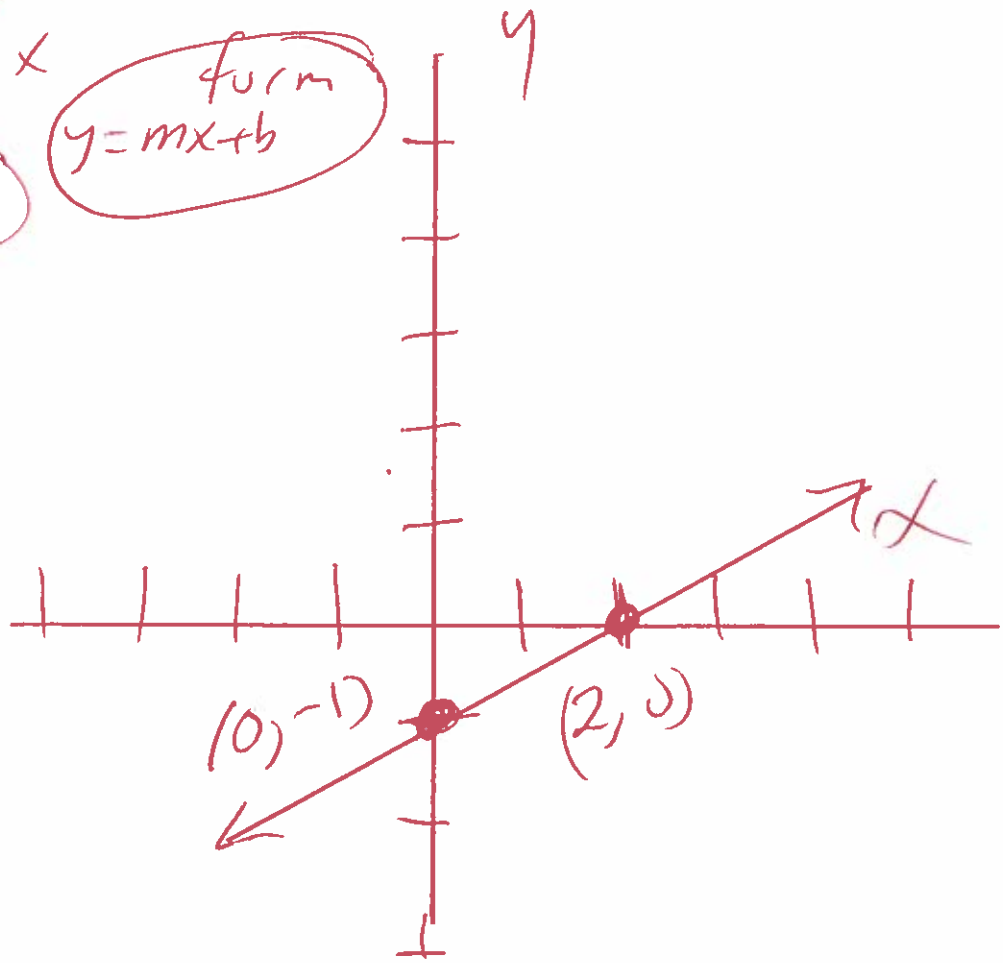
$y = 0 - 1$

$y = -1$

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

$y = 1 - 1$

$y = 0$



18. $(3, 8)$ and $(2, 4)$ find slope

x_1, y_1 $\quad x_2, y_2$

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

$$m = \frac{(8) - (4)}{(3) - (2)}$$

$$m = \frac{8-4}{3-2}$$

$$m = \frac{4}{1}$$

$m = 4$ slope

19. $(8, -1)$ and $(8, 7)$ find slope

x_1, y_1 $\quad x_2, y_2$

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

$$m = \frac{(-1) - (7)}{(8) - (8)}$$

$$m = \frac{-1-7}{8-8}$$

$$m = \frac{-8}{0}$$

Undefined

Slope is undefined

20. $(-5, 9)$ and $(-10, -10)$ find slope
x_1, y_1 x_2, y_2

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

$$m = \frac{(9) - (-10)}{(-5) - (-10)}$$

$$m = \frac{9 + 10}{-5 + 10}$$

$$m = \frac{19}{5}$$ slope

21. $(2, 6)$ and $(-2, 6)$ find slope
x_1, y_1 x_2, y_2

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

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

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

$$m = \frac{0}{4}$$

$m = 0$ slope

22. $7x+y=2$ find slope

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

$y=2-7x$

$y=-7x+2$ $\quad$ form $y=mx+b$

slope $=m=-7$ $\quad$ y-intercept $=2$

slope $\quad$ y-intercept

---

23. $7x-2y=14$ find slope

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

$-2y=14-7x$

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

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

$y=\frac{7}{2}x-7$ $\quad$ form $y=mx+b$

slope $=m=\frac{7}{2}$ $\quad$ y-intercept $=-7$

slope $\quad$ y-intercept

24. $y = \frac{5}{8}x + 3$ determine if lines are parallel, perpendicular, or neither.

$y = -\frac{5}{8}x$.

$m_1 = \frac{5}{8}$ slope of line 1

$m_2 = -\frac{5}{8}$ slope of line 2

$m_1 = \frac{5}{8} \neq \frac{-5}{8} = m_2$ not parallel

$m_1 \cdot m_2 = \left(\frac{5}{8}\right)\left(\frac{-5}{8}\right) = \frac{-25}{64} \neq -1$ not perpendicular

Neither

25 $7x = 4y + 5$

$-14x + 8y = 5$

Parallel, perpendicular or neither

$7x - 5 = 4y + 5 - 5$

$7x - 5 = 4y$

$\frac{7x}{4} - \frac{5}{4} = \frac{4y}{4}$

$\frac{7}{4}x - \frac{5}{4} = y$

OR $y = \frac{7}{4}x - \frac{5}{4}$

Slope

$m_1 = \frac{7}{4}$ ✓

$-14x + 8y + 14x = 5 + 14x$

$8y = 5 + 14x$

$\frac{8y}{8} = \frac{5}{8} + \frac{14x}{8}$

$y = \frac{5}{8} + \frac{14x}{8}$

$y = \frac{14x}{8} + \frac{5}{8}$

$y = \frac{2(7x)}{2(4)} + \frac{5}{8}$

$y = \frac{7x}{4} + \frac{5}{8}$

Slope

$m_2 = \frac{7}{4}$ ✓

$m_1 = m_2$ Lines are parallel

26) $3+2x=8y$ Parallel, perpendicular, or neither

$8x+2y=8$

$\frac{3}{8}+\frac{2x}{8}=\frac{8y}{8}$

$\frac{3}{8}+\frac{2x}{8}=y$

$y=\frac{2x}{8}+\frac{3}{8}$

$y=\frac{8(1x)}{8(4)}+\frac{3}{8}$

$y=\frac{1}{4}x+\frac{3}{8}$

Slope

$m_1=\frac{1}{4}$

$8x+2y=8$

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

$2y=8-8x$

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

$y=4-4x$

$y=-4x+4$

Slope

$m_2=-4$

$m_1 \cdot m_2=\left(\frac{1}{4}\right)(-4)=\frac{-4}{4}=-1$

Since $m_1 \cdot m_2=-1$ then lines are perpendicular

27) $3x+2y=8$ sub 4

$3x+2y-3x=8-3x$

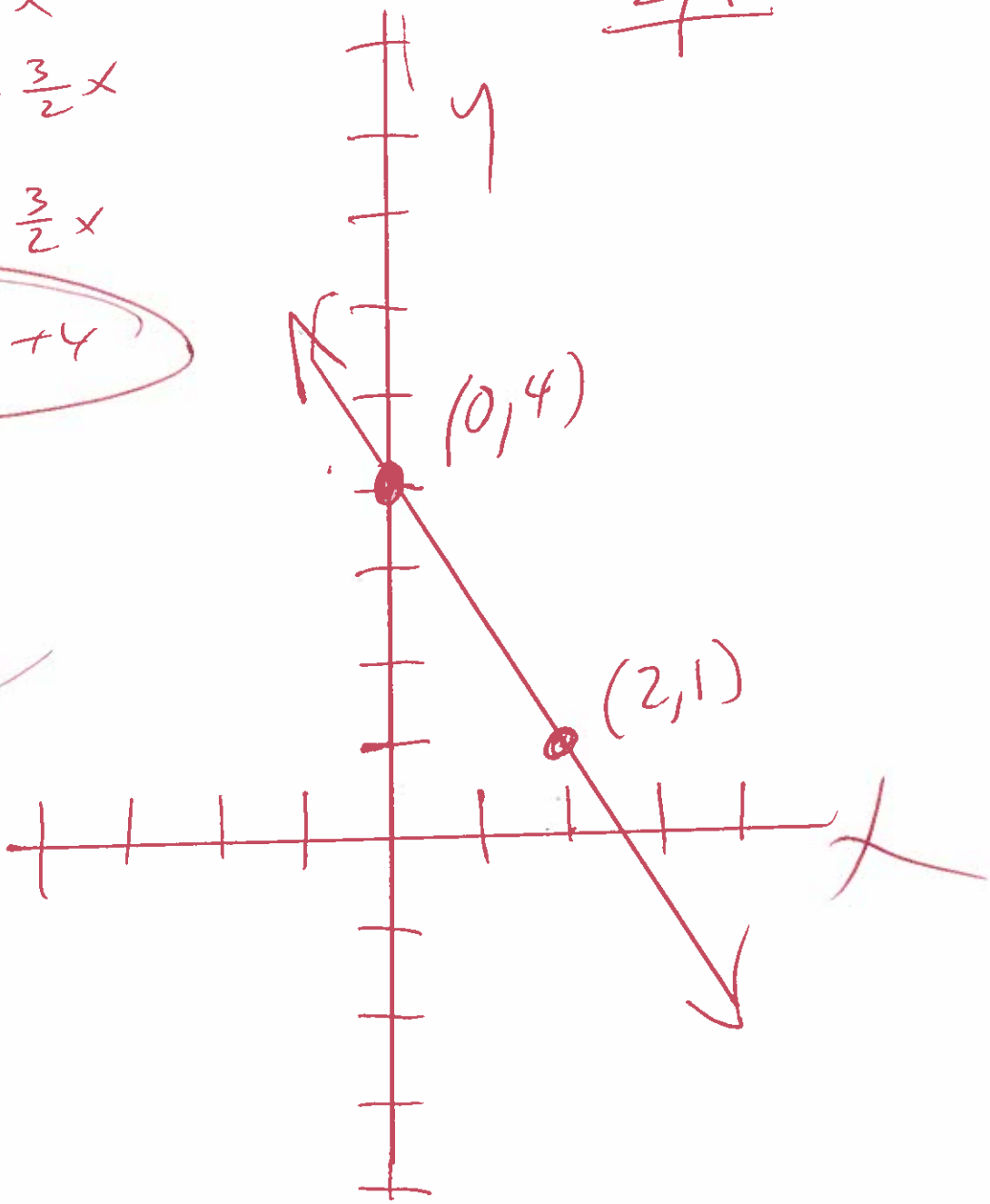
$2y=8-3x$

$\frac{2y}{2}=\frac{8}{2}-\frac{3}{2}x$

$y=4-\frac{3}{2}x$

$y=-\frac{3}{2}x+4$

x	y
0	4
2	1



$y=-\frac{3}{2}(0)+4$

$y=0+4$

$y=4$

$y=-\frac{3}{2}(2)+4$

$y=-3+4$

$y=1$

28. Find the equation of line with slope $= m = 2$ at point $(-3, 12)$
$x_1 \quad y_1$

$y - y_1 = m(x - x_1)$ Point slope formula

$y - (12) = 2(x - (-3))$

$y - 12 = 2(x + 3)$

$y - 12 = 2x + 6$

$y - 12 + 12 = 2x + 6 + 12$

$y = 2x + 18$

29. Find the equation of line with slope $= m = -6$ at y-intercept $(0, 8)$.
$x_1 \quad y_1$

$y - y_1 = m(x - x_1)$ Point slope formula

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

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

$y - 8 = -6(x)$

$y - 8 = -6x$

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

$y = -6x + 8$

(30) $x^2 - 5x + 3 =$ eval if $x = -1$

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

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

$1 + 5 + 3 =$

$6 + 3 =$

$9 =$

(31) determine if (2, 5) OR (3, 8) are solutions

$3x - y = 1$

$x + 3y = 17$

(2, 5)

Yes a solution

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

$6 - 5 = 1$

$1 = 1$ ✓ Good solution

$(2) + 3(5) = 17$

$2 + 15 = 17$ Good ✓

$17 = 17$

$3x - y = 1$

$x + 3y = 17$

(3, 8)

NOT a solution

$3(3) - (8) = 1$

$9 - 8 = 1$

$1 = 1$ ✓ Good

$(3) + 3(8) = 17$

$3 + 24 = 17$

$27 \neq 17$

NO BAD

32

$6x - y = 9$

$5x + y = 13$

$11x + 0 = 22$

$11x = 22$

$\frac{11x}{11} = \frac{22}{11}$

$x = 2$

Subst

$6x - y = 9$

$6(2) - y = 9$

$12 - y = 9$

$12 - y - 12 = 9 - 12$

$-y = -3$

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

$y = 3$

$(x, y) = (2, 3)$

33

$5x + y = -5$

$7x - 3y = -73$

$\begin{matrix} 5x + 1y = -5 \\ 7x - 3y = -73 \end{matrix} \begin{matrix} (3) \\ (1) \end{matrix}$ mult

$15x + 3y = -15$

$7x - 3y = -73$

$22x + 0 = -88$

$22x = -88$

$\frac{22x}{22} = \frac{-88}{22}$

$x = -4$

Subst

$5x + y = -5$

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

$-20 + y = -5$

$-20 + y + 20 = -5 + 20$

$y = 15$

$(x, y) = (-4, 15)$

34. $3x+4y=6$

$6x+8y=0$

$3x+4y=6 \quad (-8)$

$6x+8y=0 \quad (4)$ Mult

$-24x-32y=-48$

$24x+32y=0$

$0+0=-48$

$0 \neq -48$

There is no solution, $\emptyset$, $\{\}$.

35. $4x+y=-9$

$-8x-2y=18$

$4x+1y=-9 \quad (2)$

$-8x-2y=18 \quad (1)$ Mult

$8x+2y=-18$

$-8x-2y=18$

$0+0=0$

$0=0$

There are infinitely many solutions.

$\{(x,y) \mid 4x+y=-9\}$ OR $\{(x,y) \mid -8x-2y=18\}$

36. $P(x) = x^2 + x + 1$ find $P(8)$

$P(8) = (8)^2 + (8) + 1$

$P(8) = (8)(8) + (8) + 1$

$P(8) = 64 + 8 + 1$

$P(8) = 72 + 1$

$P(8) = 73$ ✓

37. $(-12x - 2) + (7x^2 + 12x - 10) =$

$-12x - 2 + 7x^2 + 12x - 10 =$

$7x^2 - 12 =$ ✓

38. $(3y^2 + 8y - 7) - (-4y + 2) =$

$3y^2 + 8y - 7 + 4y - 2 =$

$3y^2 + 12y - 9 =$ ✓

39. $(-9y^2 - 5y) + (3y^2 + 2y - 2) =$

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

$-6y^2 - 3y - 2 =$ ✓

40. $P(x) = 4x+2$ and $Q(x) = 2x^2 - 9x + 5$

Find $P(x) + Q(x) =$

$(4x+2) + (2x^2 - 9x + 5) =$

$4x + 2 + 2x^2 - 9x + 5 =$

$2x^2 - 5x + 7 =$

41. $(4y+7)^2 =$

$(4y+7)(4y+7) =$

$16y^2 + 28y + 28y + 49 =$

$16y^2 + 56y + 49 =$

42. $(3x+4)(5x+9) =$

$15x^2 + 27x + 20x + 36 =$

$15x^2 + 47x + 36 =$

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

$x^3-4x^2+3x-5x^2+20x-15 =$

$x^3-9x^2+23x-15 =$

44. $(x+4)(x^3-6x+7) =$

$x^4-6x^2+7x+4x^3-24x+28 =$

$x^4+4x^3-6x^2-17x+28 =$

45. $(6a+3)(9a^2+2a-3) =$

$54a^3+12a^2-18a+27a^2+6a-9 =$

$54a^3+39a^2-10a-9 =$

46. $(7C+D)(7C-D) =$

$49C^2-7CD+7CD-D^2 =$

$49C^2-D^2 =$

47. $(10x-3)(6x+5) =$

$60x^2 + 50x - 18x - 15 =$

$60x^2 + 32x - 15 =$ ✓

48. $3^{-3} =$

$\frac{1}{3^3} =$ rewrite

$\frac{1}{3 \cdot 3 \cdot 3} =$

$\frac{1}{27} =$ ✓

49. $\left(\frac{x^{-1}y^3}{x^3y^7}\right)^2 =$

$\left(\frac{y^3}{x^3x^1y^7}\right)^2 =$ rewrite

$\left(\frac{1}{x^{3+1}y^{7-3}}\right)^2 =$

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

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

$\frac{1^2}{x^8y^8} =$

$\frac{1 \cdot 1}{x^8y^8} =$

$\frac{1}{x^8y^8} =$ ✓

50 $\dfrac{(-2xy^{-4})^{-5}}{(xy^{-3})^{-1}}$

$\dfrac{((-2)^1x^1y^{-4})^{-5}}{(x^1y^{-3})^{-1}} =$

$\dfrac{(-2)^{1(-5)}\,x^{1(-5)}\,y^{-4(-5)}}{x^{1(-1)}y^{-3(-1)}} =$

$\dfrac{(-2)^{-5}\,x^{-5}\,y^{20}}{x^{-1}\,y^{3}} =$

$\dfrac{x^1\,y^{20}}{(-2)^5x^5\,y^3} =$

$\dfrac{y^{20-3}}{(-2)(-2)(-2)(-2)(-2)\,x^{5-1}} =$

$\dfrac{y^{17}}{-32x^4} =$

51. $(6x^2+13x+11) \div (x+1)$

Use synthetic division

$$\frac{6x^2+13x+11}{x+1} =$$

opp

-1	6	13	11
		-6	-7
	6	7	4 rem

$$6x+7+\frac{4}{x+1}$$

52. $-48x^6y^6 - 18x^8y^5 =$ factor

GCF $\rightarrow$ $6x^6y^5(-8y-3x^2) =$

53. $x^2-x-30 =$ factor

Possible
30 . 1
15 . 2
10 . 3
6 . 5

$(x+5)(x-6) =$

Check foil $(x+5)(x-6) =$

$x^2-6x+5x-30 =$

$x^2-1x-30 =$

$x^2-x-30 =$ Good

54) $36x^2 - 169y^2 =$

$(6x)^2 - (13y)^2 =$

$(6x+13y)(6x-13y) =$

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

55. $x(x+9)=0$ Solve

$x=0$ OR $x+9=0$

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

$x=-9$

$\{0, -9\}$

56. $(2x+9)(6x-7)=0$ Solve

set $2x+9=0$ OR $6x-7=0$

$2x+9-9=0-9$ OR $6x-7+7=0+7$

$2x=-9$ OR $6x=7$

$\frac{2x}{2}=\frac{-9}{2}$ OR $\frac{6x}{6}=\frac{7}{6}$

$x=-\frac{9}{2}$ OR $x=\frac{7}{6}$

$\left\{-\frac{9}{2}, \frac{7}{6}\right\}$

57. $x^2 - 13x + 40 = 0$

$(x-5)(x-8) = 0$

40.1
20.2
10.4
8.5
Possible

Set $x-5=0$ OR $x-8=0$

$x-5+5=0+5$ OR $x-8+8=0+8$

$x=5$ OR $x=8$

$\{5, 8\}$

Use Quadratic Formula

$1x^2 - 13x + 40 = 0$

$a=1 \quad b=-13 \quad c=40$

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

$$x = \frac{-(-13) \pm \sqrt{(-13)^2 - 4(1)(40)}}{2(1)}$$

$$x = \frac{13 \pm \sqrt{169-160}}{2}$$

$$x = \frac{13 \pm \sqrt{9}}{2}$$

$$x = \frac{13 \pm 3}{2}$$

$$x = \frac{13-3}{2} \text{ OR } x = \frac{13+3}{2}$$

$$x = \frac{10}{2} \text{ OR } x = \frac{16}{2}$$

$x=5$ OR $x=8$