1. $-48 \div \sqrt{16} \times 2$

$\sqrt{16} = 4$

$= \left(\frac{-48}{4}\right) \times 2 \quad = -12 \times 2$

$= -24$

2. $9x + \frac{2}{7} - x + \frac{4}{3}$

$= (9x - x) + \left(\frac{2}{7} + \frac{4}{3}\right)$

$\Rightarrow \frac{2}{7} + \frac{4}{3} \quad \frac{6+28}{21} = \frac{34}{21}$

$= 8x + \frac{34}{21}$

3. $-4x + 14y$ if $x = -3$ and $y = \frac{4}{7}$

$= -4(-3) + 14\left(\frac{4}{7}\right)$

$= 12 + 8$

$= 20$

4. $2x + 12 = 4x - 10$

$2x - 4x = -10 - 12$

$-2x = -22$

$2x = 22$

$x = \frac{22}{2} = 11$

$x = 11$

5. $18x + 15 = 5(2x+1) - 2x$

Solving RHS : $5(2x+1) - 2x = 10x + 5 - 2x$

$= 8x + 5$

$\Rightarrow 18x + 15 = 8x - 5$

$18x - 8x = +5 - 15$

$10x = -10$

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

$x = -1$

6. $\frac{1}{3}x - 4 = \frac{2}{7}x$

$\frac{1}{3}x - \frac{2}{7}x = 4$

Solve for the LHS

$\frac{1}{3}x - \frac{2}{7}x = \frac{(7-6)x}{21} = \frac{1}{21}x$

$\frac{1}{21}x = 4$

$x = 21 \times 4$

$x = 84$

7. Base salary : $ 500

$2000 = 500 + 20(x)$ → Equation

where x = number of memberships

$2000 - 500 = 20x$

$1500 = 20x$

$x = \frac{1500}{20} = 75$

} solution

He must sell 75 memberships

8. $-6(x+4) \leq 18$

Opening bracket: $-6x - 24$

$-6x - 24 \not\leq 18$

$-16x \leq 18 + 24$

$-16x \leq 42$

$16x \not\geq -42$

$x \not\geq \frac{-42}{16}$

$x \not\geq$

$-6x - 24 \leq 18$

$-6x \leq 18 + 24$

$-6x \leq 42$

$6x \geq -42$

$x \geq \frac{-42}{6}$

$x \geq -7$

solution: $x \geq -7$

9. $r = \frac{d}{t}$

Solve for d if $r = 70$, $t = 5$

$70 = \frac{d}{5}$

$d = 70 \times 5$

$= 350$

10 $12x + 4y = 36$

$4y = 36 - 12x$

$y = \frac{36 - 12x}{4}$

$y = \frac{36}{4} - \frac{12x}{4}$

$y = 9 - 3x$

11 $\frac{4}{5} = \frac{9}{n}$

$4n = 5 \times 9$

$n = \frac{5 \times 9}{4} = \frac{45}{4}$

$n = 11.25$

12. 1.5 ml → 50 pounds

x ← 175 pounds?

Proportion

$$\frac{175}{x} = \frac{50}{1.5}$$

Solution: $50x = 1.5 \times 175$

$$x = \frac{1.5 \times 175}{50}$$

$$= 5.25 \text{ ml}$$

13

26% of x = 208

$$\Rightarrow \frac{26}{100} \times x = 208$$

$$x = \frac{208 \times 100}{26}$$

$$= 800$$

14

Bill - $ 80

tip → $ 12

$$= \frac{12}{80} \times 100\%$$

$$= 15\%$$

15

$4x - 5y = -13$; $x = -2$

Rewritting by making y the subject:

$-5y = -13 - 4x$

$5y = 13 + 4x$

$y = \frac{13 + 4x}{5}$

$y = \frac{13 + 4(-2)}{5}$

$y = \frac{13 - 8}{5} = \frac{5}{5}$

$y = 1$

$(-2, 1)$

16 $6x - 4y = -24$

(a) x-intercept

ie when $y = 0$

$6x - 0 = -24$; $6x = -24$

$x = \frac{-24}{6}$

$x = -4$

$(-4, 0)$

(b) y-intercept

ie when $x = 0$

$$0 - 4y = -24$$

$$4y = 24$$

$$y = \frac{24}{4} = 6$$

$(0, 6)$

17. $(-4, 2)$ and $(6, -3)$

$$\text{slope, } m = \frac{\Delta y}{\Delta x} = \frac{2 - (-3)}{-4 - 6}$$

$$= \frac{5}{-10}$$

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

18. $m = -2$, $(1, -9)$, (x, y)

$$m = \frac{\Delta y}{\Delta x} = \frac{y - (-9)}{x - 1}$$

$$\Rightarrow \quad -2 = \frac{y + 9}{x - 1}$$

$$-2x + 2 = y + 9$$

$$y = -2x + 2 - 9$$

$$y = -2x - 7$$

19.

Line passes through: $(-1, 2)$ and $(0, -1)$

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

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

$$= -3 \quad \text{(line has a negative slope)}$$

$$-3 = \frac{y+1}{x-0}$$

$$-3x = y + 1$$

$$y = -3x - 1$$

20.

Equation: $-2x + y = -4$

Making y the subject: $y = 2x - 4$

To find the two points, substitute $x = 0$ and $x = 2$ into the equation

(i) $x = 0$

$y = 0 - 4$, $y = -4$

Point: $(0, -4)$

(ii) $x = 2$

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

$$y = 4 - 4$$

$$y = 0$$

Point : $(2, 0)$