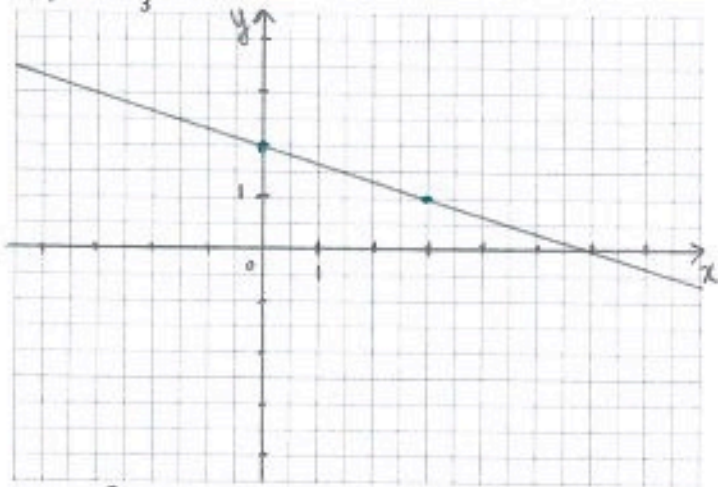


1. Graph the following lines and show at least 2 exact points :

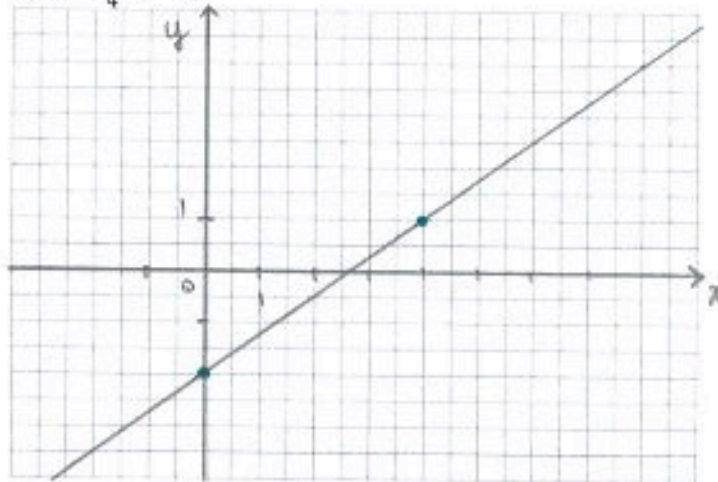
a)  $y = -\frac{1}{3}x + 2$



slope:  $-\frac{1}{3}$

y-intercept: 2

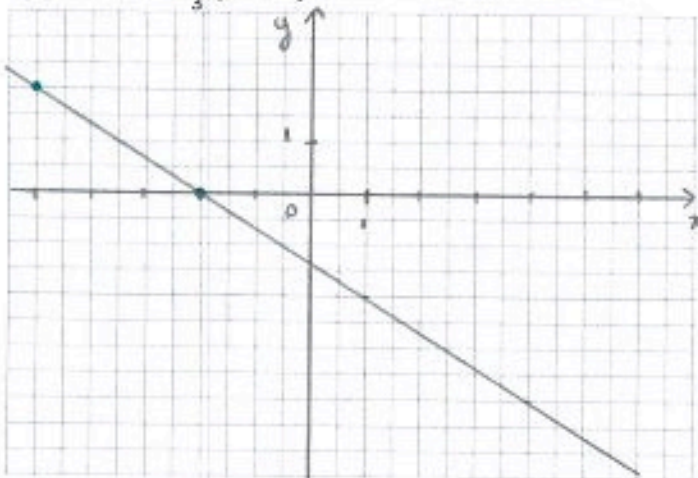
a)  $y = \frac{3}{4}x - 2$



slope:  $\frac{3}{4}$

y-intercept: -2

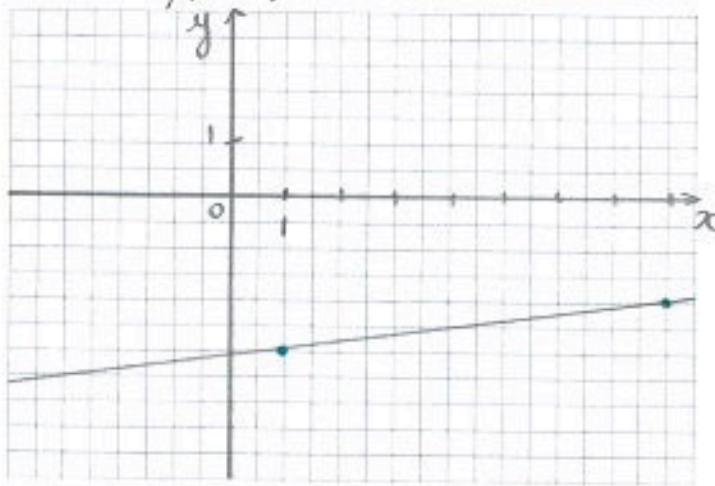
b)  $y - 2 = -\frac{2}{3}(x + 5)$



slope:  $-\frac{2}{3}$

point: (-5, 2)

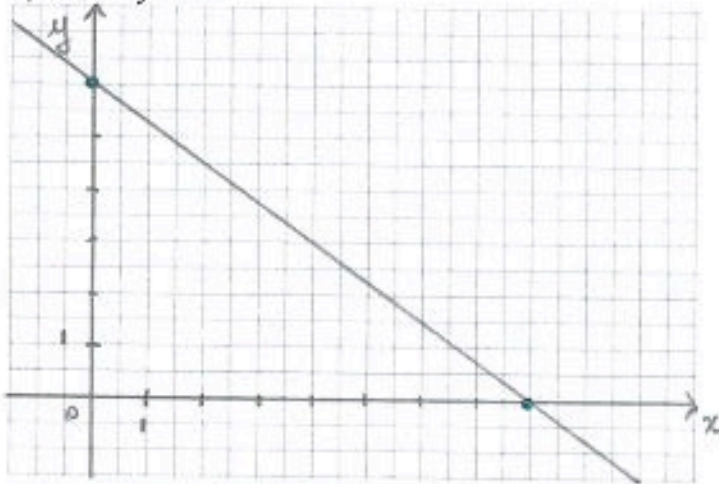
b)  $y + 3 = \frac{1}{7}(x - 1)$



slope:  $\frac{1}{7}$

point:  $(1, -3)$

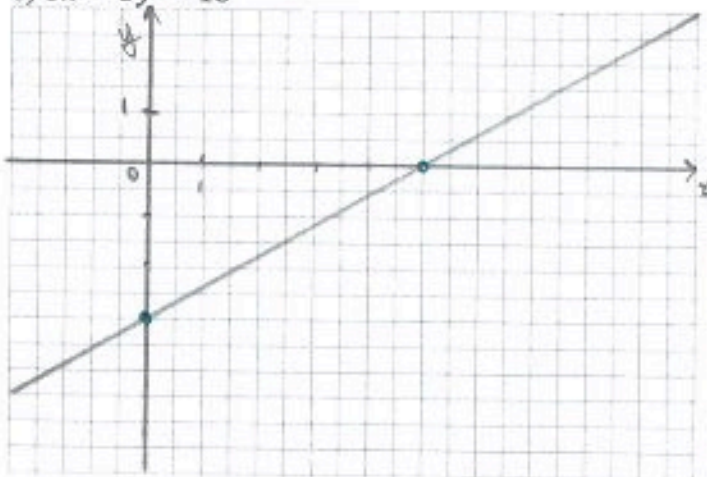
c)  $3x + 4y = 24$



x-intercept:  $3x = 24$   
 $x = 8$

y-intercept:  $4y = 24$   
 $y = 6$

c)  $3x - 5y = 15$

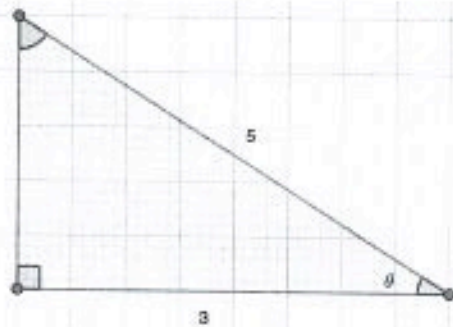


x-intercept:  $3x = 15$   
 $x = 5$

y-intercept:  $-5y = 15$   
 $y = -3$

2. For each triangle, determine the value of the variable (to the nearest tenth when relevant) :

a)

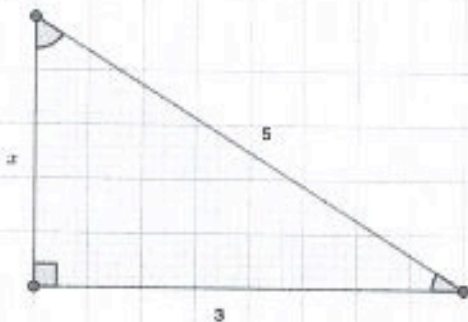


$$\cos \theta = \frac{3}{5}$$

$$\theta = \cos^{-1}\left(\frac{3}{5}\right)$$

$$\theta \approx 53.1^\circ$$

b)



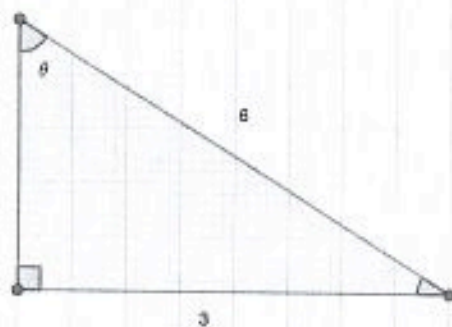
$$x^2 = 5^2 - 3^2$$

(Pythagorean Theorem)

$$x^2 = 16$$

$$x = 4$$

c)

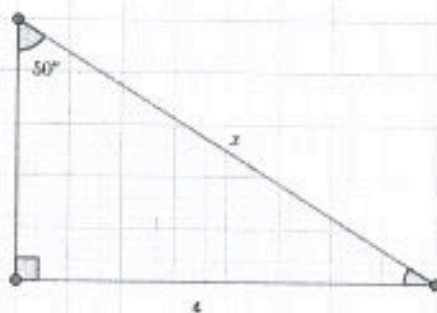


$$\sin \theta = \frac{3}{6}$$

$$\theta = \sin^{-1}\left(\frac{3}{6}\right)$$

$$\theta = 30^\circ$$

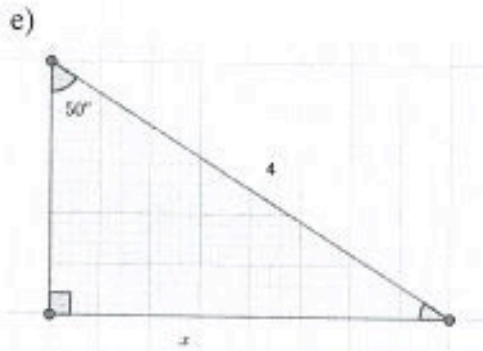
d)



$$\sin 50^\circ = \frac{4}{x}$$

$$x = \frac{4}{\sin 50^\circ}$$

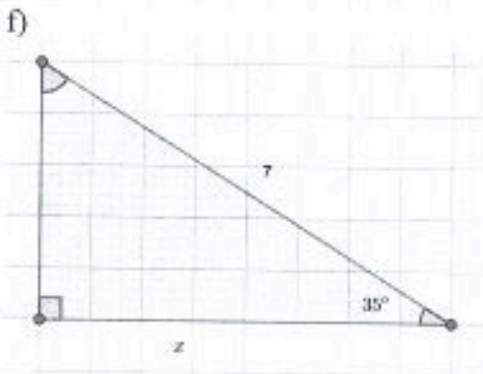
$$x \approx 5.2$$



$$\sin 50^\circ = \frac{x}{4}$$

$$x = 4 \sin 50^\circ$$

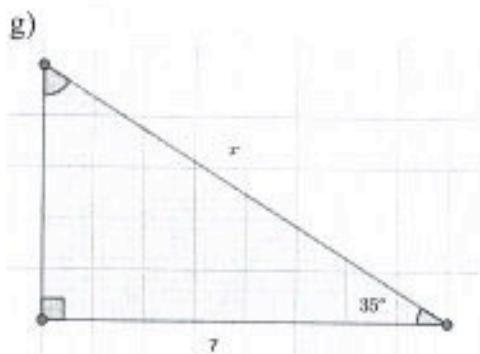
$$x \approx 3.1$$



$$\cos 35^\circ = \frac{x}{7}$$

$$x = 7 \cos 35^\circ$$

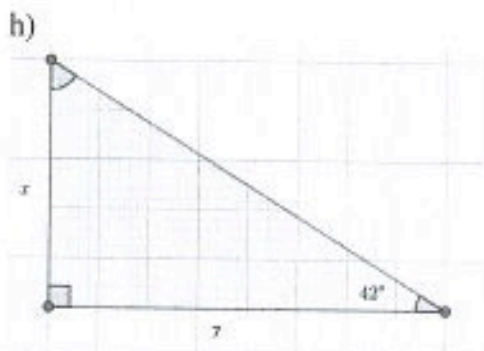
$$x \approx 5.7$$



$$\cos 35^\circ = \frac{7}{x}$$

$$x = \frac{7}{\cos 35^\circ}$$

$$x \approx 8.5$$

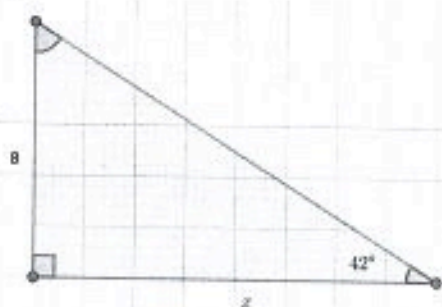


$$\tan 42^\circ = \frac{x}{7}$$

$$x = 7 \tan 42^\circ$$

$$x \approx 6.3$$

i)



$$\tan 42^\circ = \frac{8}{x}$$

$$x = \frac{8}{\tan 42^\circ}$$

$$x \approx 8.9$$

3. Solve the following systems :

$$a) \begin{cases} 2x - y = 7 \\ 4x + y = 5 \end{cases}$$

$$6x = 12$$

$$\boxed{x = 2}$$

$$2(2) - y = 7$$

$$4 - y = 7$$

$$\boxed{y = -3}$$

solution  $\{(2, -3)\}$

$$a) \begin{cases} 3x + 2y = 8 & \times 5 \\ 5x - 3y = -12 & \times (-3) \end{cases}$$

$$\begin{array}{r} 15x + 10y = 40 \\ -15x + 9y = 36 \\ \hline 19y = 76 \end{array}$$

$$\boxed{y = 4}$$

$$\begin{array}{r} 9x + 6y = 24 \\ 10x - 6y = -24 \\ \hline 19x = 0 \end{array}$$

$$\boxed{x = 0}$$

solution  $\{(0, 4)\}$

4. Solve

$$a) 3 - 2(x - 3) = 5x - 6$$

$$3 - 2x + 6 = 5x - 6$$

$$15 = 7x$$

$$\boxed{x = \frac{15}{7}}$$

$$\begin{aligned} \text{b) } -3(x - 5) &= 2x + 7 \\ -3x + 15 &= 2x + 7 \\ -5x &= -8 \\ \boxed{x} &= \frac{8}{5} \end{aligned}$$

5. Expand the following expressions and simplify :

$$\begin{aligned} A &= (3x + 4)(5x - 6) - (2x + 1)(3x - 1) \\ &= 15x^2 - 18x + 20x - 24 - (6x^2 - 2x + 3x - 1) \\ &= 15x^2 + 2x - 24 - 6x^2 - x + 1 \\ &= 9x^2 + x - 23 \end{aligned}$$

$$\begin{aligned} B &= (5x - 2)^2 - 5(3x - 1) \\ &= 25x^2 - 20x + 4 - 15x + 5 \\ &= 25x^2 - 35x + 9 \end{aligned}$$

$$\begin{aligned} C &= (2x - 1)(2x + 1) - (x - 3)^2 \\ &= 4x^2 - 1 - (x^2 - 6x + 9) \\ &= 4x^2 - 1 - x^2 + 6x - 9 \\ &= 3x^2 + 6x - 10 \end{aligned}$$

$$\begin{aligned} D &= (2x - 3)(x + 2) - 5x(x + 5) \\ &= 2x^2 + 4x - 3x - 6 - 5x^2 - 25x \\ &= -3x^2 - 24x - 6 \end{aligned}$$

6. Factor the following expressions as much as possible :

$$A = 4x^2 - 16x$$

$$= 4x(x - 4)$$

$$B = x^2 - x - 2$$

$$= (x - 2)(x + 1)$$

$$C = 25x^2 - 4$$

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

$$D = 25x^2 - 30x + 9$$

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

$$E = 81x^2 + 18x$$

$$= 9x(9x + 2)$$

$$F = x^2 + x - 12$$

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

$$G = 49x^2 - 1$$

$$= (7x + 1)(7x - 1)$$

$$H = 36x^2 + 60x + 25$$

$$= (6x + 5)^2$$

7. Express the following equations in slope-intercept form :

a)  $y - 3 = -\frac{2}{5}(x + 3)$

$$y - 3 = -\frac{2}{5}x - \frac{6}{5}$$

$$y = -\frac{2}{5}x - \frac{6}{5} + \frac{15}{5}$$

$$y = -\frac{2}{5}x + \frac{9}{5}$$

b)  $2x - 4y = 7$

$$-4y = -2x + 7$$

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

a)  $y + 2 = -\frac{3}{4}(x - 5)$

$$y + 2 = -\frac{3}{4}x + \frac{15}{4}$$

$$y = -\frac{3}{4}x + \frac{15}{4} - \frac{8}{4}$$

$$y = -\frac{3}{4}x + \frac{7}{4}$$

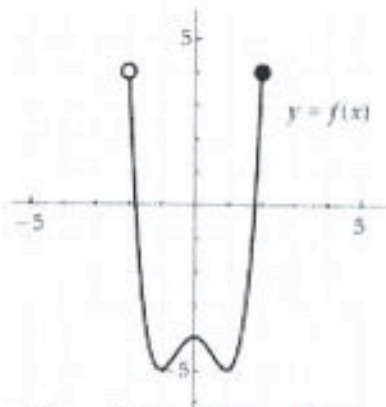
b)  $5x - 2y = 8$

$$-2y = -5x + 8$$

$$y = \frac{5}{2}x - 4$$



8. Use the following graph to answer the questions (you can use approximations when needed):



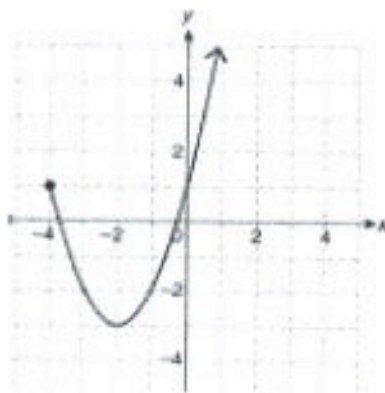
a) Domain :  $[-2, 2]$

b) Range :  $[-5, 4]$

c)  $f(-1) = -5$

d) solve  $f(x) = -1$        $x \approx \pm 1.9$

9. Use the following graph to answer the questions (you can use approximations when needed):



a) Domain :  $[-4, +\infty)$

b) Range :  $[-3, +\infty)$

c)  $f(-2) = -3$

d) solve  $f(x) = -2$        $x = -3, x = -1$