

Revision Sheet 2 Solutions

Q1. i) $3x - 6 = -9$

$$3x = -9 + 6$$

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

$$\boxed{x = -1}$$

ii) $3x - 10 = -14$

$$3x = -14 + 10$$

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

$$\boxed{x = -\frac{4}{3}}$$

iii) $3(x-2) = 7(x+5) - 13$

$$3x - 6 = 7x + 35 - 13$$

$$3x - 6 = 7x + 22$$

$$3x - 7x = 6 + 22$$

$$\frac{-4x}{-4} = \frac{28}{-4}$$

$$\boxed{x = -7}$$

iv) $3(y-1) = 1 + 4y$

$$3y - 3 = 1 + 4y$$

$$3y - 4y = 1 + 3$$

$$\frac{-y}{-1} = \frac{4}{-1}$$

$$\boxed{y = -4}$$

Q2 i) $\frac{a+3}{4} = \frac{1}{2}$

Cross multiplying:

$$2(a+3) = 4(1)$$

$$2a + 6 = 4$$

$$2a = 4 - 6$$

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

$$\boxed{a = -1}$$

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

Multiply by 4:

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

$$2(x-3) + 1(2x+3) = 12$$

$$2x - 6 + 2x + 3 = 12$$

$$4x = 12 + 6 - 3$$

$$\frac{4x}{4} = \frac{15}{4}$$

$$\boxed{x = \frac{15}{4}}$$

iii) $\frac{4x+5}{5} - \frac{2x-3}{7} = \frac{32}{35}$

Multiply by 35

$$35\left(\frac{4x+5}{5}\right) - 35\left(\frac{2x-3}{7}\right) = 35\left(\frac{32}{35}\right)$$

$$7(4x+5) - 5(2x-3) = 32$$

$$28x + 35 - 10x + 15 = 32$$

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

$$\boxed{x = -1}$$

Q3 i)

$$2(s-3t) = 9$$

$$2s - 6t = 9$$

$$-6t = 9 - 2s$$

$$\frac{6t}{6} = \frac{2s-9}{6}$$

$$t = \frac{2s-9}{6}$$

ii)

$$v^2 = u^2 + 2as$$

$$v^2 - u^2 = \frac{2as}{2s}$$

$$\frac{v^2 - u^2}{2s} = a$$

iii)

$$\frac{A}{2\pi h} = \frac{2\pi r h}{2\pi h}$$

$$\frac{A}{2\pi h} = r$$

Q4. i) A: $x + y = 4$
 B: $x - y = 10$

$$\frac{2x}{2} = \frac{14}{2}$$

$$x = 7$$

Put x into A

A: $x + y = 4$

$$7 + y = 4$$

$$y = 4 - 7$$

$$y = -3$$

ii) A: $3x + 5y = -15$

B: $4x + 3y = -9$

Ax3: $9x + 15y = -45$

Bx5: $20x + 15y = -45$

$$\frac{-11x}{-11} = \frac{0}{-11}$$

$$x = 0$$

Put x into A

A: $3(0) + 5y = -15$

$$\frac{5y}{5} = \frac{-15}{5}$$

$$y = -3$$

iii) A: $3x + 2y = 21$
 B: $4x - 5y = 28$

A \times 5: $15x + 10y = 105$
 B \times 2: $8x - 10y = 56$

$$\begin{array}{r} 23x \\ \underline{23} \end{array} = \frac{161}{23}$$

$x = 7$

Put x into A

A: $3x + 2y = 21$

$3(7) + 2y = 21$

$21 + 2y = 21$

$2y = 21 - 21$

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

$y = 0$

iv) A: $\frac{5}{4}x - \frac{3}{4}y = 3$
 B: $3x + 2y = 11$

A \times 4: $5x - 3y = 12$

B: $3x + 2y = 11$

A \times 2: $10x - 6y = 24$

B \times 3: $9x + 6y = 33$

$$\begin{array}{r} 19x \\ \underline{19} \end{array} = \frac{57}{19}$$

$x = 3$

Put x into A

A: $5x - 3y = 12$

$5(3) - 3y = 12$

$15 - 3y = 12$

$-3y = 12 - 15$

$-3y = -3$

$y = 1$

Q5 i) $3x - 8 > 4, x \in \mathbb{Z}$

$3x > 4 + 8$

$\frac{3x}{3} > \frac{12}{3}$

$x > 4$



ii) $4x + 3 \geq 6x - 4, x \in \mathbb{N}$

$4x - 6x \geq -4 - 3$

$-2x \geq -7$

$\frac{2x}{2} \leq \frac{7}{2}$ (change direction of sign)

$x \leq \frac{7}{2}$



$$\text{iii) } 4(x-3) \geq -2(x+1)+2, x \in \mathbb{R}$$

$$4x - 12 \geq -2x - 2 + 2$$

$$4x + 2x \geq -2 + 2 + 12$$

$$\frac{6x}{6} \geq \frac{12}{6}$$

$$x \geq 2$$



$$\text{iv) } -\frac{3(2x+3)}{2} \leq -\frac{4(x+4)}{3}, x \in \mathbb{Z}$$

Multiply both sides by 6:

$$3 \cancel{6} \left(-\frac{3(2x+3)}{\cancel{2}} \right) \leq 2 \cancel{6} \left(-\frac{4(x+4)}{\cancel{3}} \right)$$

$$-9(2x+3) \leq -8(x+4)$$

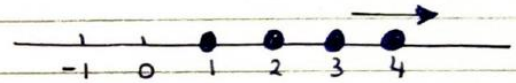
$$-18x - 27 \leq -8x - 32$$

$$-18x + 8x \leq -32 + 27$$

$$\frac{-10x}{-10} \leq \frac{-5}{-10}$$

$$x \geq \frac{1}{2}$$

* switch direction needed



Past Exam Questions

$$\text{Q6. } \frac{3x+1}{5} + \frac{x-2}{2} = \frac{47}{10}$$

Multiply each term by 10:

$$10 \left(\frac{3x+1}{5} \right) + 10 \left(\frac{x-2}{2} \right) = 10 \left(\frac{47}{10} \right)$$

$$2(3x+1) + 5(x-2) = 47$$

$$6x + 2 + 5x - 10 = 47$$

$$11x = 47 - 2 + 10$$

$$\frac{11x}{11} = \frac{55}{11}$$

$$x = 5$$

$$\text{Q7. } 2(3-x) < 8$$

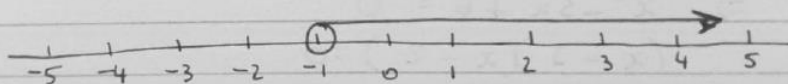
$$6 - 2x < 8$$

$$-2x < 8 - 6$$

$$-2x < 2$$

÷ both sides by -2 so switch direction of inequality symbol

$$\Rightarrow x > -1$$



Q8. $P = \frac{RT}{5252}$

Mult both sides by 5252:

$$5252P = RT$$

Divide both sides by T:

$$\Rightarrow \frac{5252P}{T} = R$$

$$\boxed{R = \frac{5252P}{T}}$$

Q9. A: $2a + 3b = 15$

B: $5a + b = -8$

A: $2a + 3b = 15$
 $8 \times 3 \begin{matrix} (-) \\ (-) \end{matrix} 5a + 3b = \begin{matrix} (-) \\ (+) \end{matrix} -24$

$$\begin{array}{r} -13a = 39 \\ \hline -13 \quad -13 \end{array}$$

$$\Rightarrow \boxed{a = -3}$$

Put a into B:

$$5a + b = -8$$

$$5(-3) + b = -8$$

$$-15 + b = -8$$

$$b = -8 + 15$$

$$\boxed{b = 7}$$

Q10. $11x - 5(2x - 1) = 3(6 - x) + 3$

$$11x - 10x + 5 = 18 - 3x + 3$$

$$11x - 10x + 3x = 18 + 3 - 5$$

$$\frac{4x}{4} = \frac{16}{4}$$

$$\Rightarrow \boxed{x = 4}$$