

7 Solve.

$$\begin{aligned}4x - 3 &\geq 9 \\+3 &+3 \\4x &\geq 12 \\\div 4 &\div 4 \\x &\geq 3\end{aligned}$$

$$\underline{\hspace{10em} x \geq 3 \hspace{10em}} \quad [2]$$

6 Solve the inequality.

$$\begin{aligned}7 &\leq 11x \\\div 11 &\div 11 \\\frac{7}{11} &\leq x \quad \text{or} \quad x \geq \frac{7}{11}\end{aligned}$$

$$\underline{\hspace{10em} x \geq \frac{7}{11} \hspace{10em}} \quad [1]$$

15 Solve.

$$\begin{aligned}12x - 3 &\geq 4x + 13 \\-4x &-4x \\8x - 3 &\geq 13 \\+3 &+3 \\8x &\geq 16 \\\div 8 &\div 8 \\x &\geq 2\end{aligned}$$

$$\underline{\hspace{10em} x \geq 2 \hspace{10em}} \quad [2]$$

7 Solve $2x + 3 < 5x - 12$.

$$\begin{aligned}2x + 3 &< 5x - 12 \\-2x &-2x \\3 &< 3x - 12 \\+12 &+12 \\15 &< 3x \\\div 3 &\div 3 \\5 &< x\end{aligned}$$

$$\underline{\hspace{10em} x > 5 \hspace{10em}} \quad [2]$$

8 Solve.

(b) $11x - 3 \geq 2(2x + 9)$

$$\begin{aligned} 11x - 3 &\geq 4x + 18 \\ -4x &\quad -4x \\ 7x - 3 &\geq 18 \\ +3 &\quad +3 \\ 7x &\geq 21 \\ \div 7 &\quad \div 7 \\ \underline{x} &\geq 3 \end{aligned}$$

$x \geq 3$

[3]

5 Solve.

$9 - 2x \leq 5(x + 6)$

$$\begin{aligned} 9 - 2x &\leq 5x + 30 \\ +2x &\quad +2x \\ 9 &\leq 7x + 30 \\ -30 &\quad -30 \\ -21 &\leq 7x \\ \div 7 &\quad \div 7 \\ \underline{-3} &\leq x \end{aligned}$$

$x \geq -3$

[3]

6 Solve $2x + 6 > 5x - 10$.

$$\begin{aligned} 2x + 6 &> 5x - 10 \\ -2x &\quad -2x \\ 6 &> 3x - 10 \\ +10 &\quad +10 \\ 16 &> 3x \\ \div 3 &\quad \div 3 \\ \underline{\frac{16}{3}} &> x \end{aligned}$$

$x < \frac{16}{3}$

[2]

4 (a) Solve the inequality.

$3m + 12 \leq 8m - 5$

$$\begin{aligned} 12 &\leq 5m - 5 \\ +5 &\quad +5 \end{aligned}$$

$$\begin{aligned} 17 &\leq 5m \\ \div 5 &\quad \div 5 \end{aligned}$$

$$\underline{\frac{17}{5}} \leq m$$

$m \geq \frac{17}{5}$

[2]

11 Solve.

$$4(2x-3) \geq 43 + 3x$$

$$8x - 12 \geq 43 + 3x$$

$$\begin{array}{r} -3x \\ 5x - 12 \geq 43 \\ +12 \quad +12 \end{array}$$

$$\begin{array}{r} 5x \geq 55 \\ \div 5 \quad \div 5 \end{array}$$

$$\underline{x \geq 11}$$

$$\dots\dots\dots x \geq 11 \dots\dots\dots [3]$$

13 Solve.

$$4 - 3x \geq \frac{6-x}{5}$$

$$\begin{array}{r} 4 - 3x \geq \frac{6-x}{5} \\ \times 5 \quad \times 5 \end{array}$$

$$5(4 - 3x) \geq 6 - x$$

$$\begin{array}{r} 20 - 15x \geq 6 - x \\ +15x \quad +15x \end{array}$$

$$\begin{array}{r} 20 \geq 6 + 14x \\ -6 \quad -6 \end{array}$$

$$\begin{array}{r} 14 \geq 14x \\ \div 14 \quad \div 14 \end{array}$$

$$\underline{1 \geq x}$$

$$\dots\dots\dots x \leq 1 \dots\dots\dots [3]$$

- 7 (a) Naga has n marbles.
Panav has three times as many marbles as Naga.
Naga loses 5 marbles and Panav buys 10 marbles.
Together they now have more than 105 marbles.

Write down and solve an inequality in n .

Before:

Naga: n

Panav: $3n$

After:

Naga: $n - 5$

Panav: $3n + 10$

$$n - 5 + 3n + 10 > 105$$

$$\begin{array}{r} 4n + 5 > 105 \\ -5 \quad -5 \end{array}$$

$$\begin{array}{r} 4n > 100 \\ \div 4 \quad \div 4 \end{array}$$

$$\underline{n > 25}$$

$$\dots\dots\dots n > 25 \dots\dots\dots [3]$$

1 Write down the integer values of x that satisfy the inequality $-2 \leq x < 2$.

.....-2, -1, 0, 1..... [2]

4 Find the integer values of x when $-1 \leq x < 3$.

.....-1, 0, 1, 2..... [2]

(c) $-8 < 3x - 2 \leq 7$

(i) Solve the inequality.

$$\begin{aligned} -8 < 3x - 2 \leq 7 \\ +2 \quad \quad +2 \quad +2 \\ -6 < 3x \leq 9 \\ \div 3 \quad \quad \div 3 \quad \div 3 \\ \hline -2 < x \leq 3 \end{aligned}$$

.....-2 < x \leq 3..... [3]

(ii) Find the integer values of x that satisfy the inequality.

.....-1, 0, 1, 2, 3..... [1]

12 x is an integer and $-3 \leq 2x - 1 < 3$.

Find the values of x .

$$\begin{aligned} -3 \leq 2x - 1 < 3 \\ +1 \quad \quad +1 \quad +1 \\ -2 \leq 2x < 4 \\ \div 2 \quad \quad \div 2 \quad \div 2 \\ \hline -1 \leq x < 2 \end{aligned}$$

.....-1, 0, 1..... [2]

10 (a) Find all the positive integers which satisfy the inequality.

$$3n - 8 > 5n - 15$$

$$\begin{array}{r} -3n \quad -3n \\ 3n - 8 > 5n - 15 \end{array}$$

$$\begin{array}{r} +15 \quad +15 \\ -8 > 2n - 15 \end{array}$$

$$\begin{array}{r} \div 2 \quad \div 2 \\ 7 > 2n \end{array}$$

$$3.5 > n$$

or

$$\underline{1 < 3.5}$$

$$\dots\dots\dots 1, 2, 3 \dots\dots\dots [2]$$

(0 is neither positive or negative)

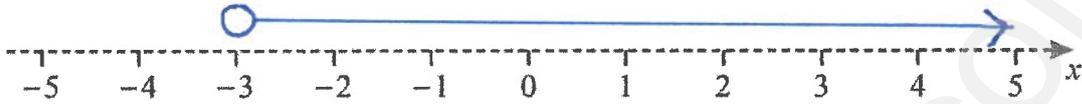
3 (a) Solve $x+9 > 6$.

$$\begin{array}{r} x+9 > 6 \\ -9 \quad -9 \end{array}$$

$$x > -3$$

$$\dots\dots\dots x > -3 \dots\dots\dots [1]$$

(b) Show your answer to part (a) on this number line.



[1]

4 (a) Solve $11+2x \geq 5$.

$$\begin{array}{r} 11 + 2x \geq 5 \\ -11 \quad -11 \end{array}$$

$$\begin{array}{r} 2x \geq -6 \\ \div 2 \quad \div 2 \end{array}$$

$$\underline{x \geq -3}$$

$$\dots\dots\dots x \geq -3 \dots\dots\dots [2]$$

(b) Show your solution to part (a) on this number line.



[1]

(b) (i) Solve.

$$x-3 \leq 5x+7$$

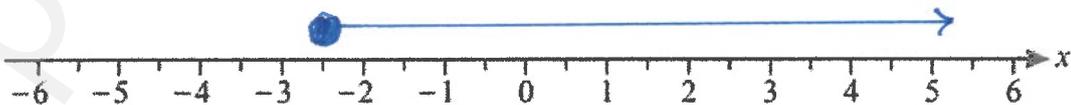
$$\begin{array}{r} x-3 \leq 5x+7 \\ -x \quad -x \end{array}$$

$$\begin{array}{r} -3 \leq 4x+7 \\ -7 \quad -7 \end{array}$$

$$\begin{array}{r} -10 \leq 4x \\ \div 4 \quad \div 4 \end{array}$$

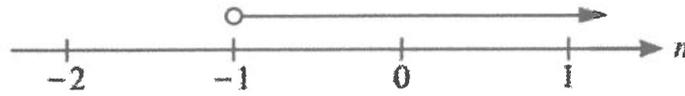
$$\dots\dots\dots x \geq -2.5 \dots\dots\dots [2]$$

(ii) Show your answer to part (b)(i) on the number line.



[1]

7



Write down the inequality, in terms of n , shown by the number line.

 $n > -1$ [1]

7 (a)



Write down the inequality in x shown by the number line.

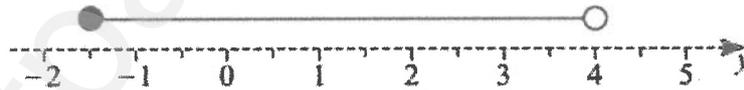
 $-2 < x \leq 1$ [2]

1 On the number line, show the inequality $-2 \leq x < 3$.



[2]

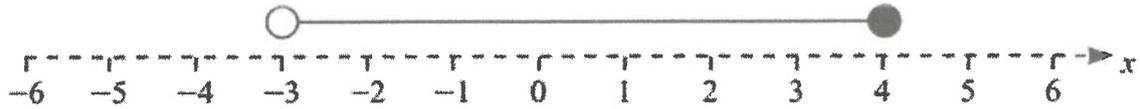
7



Write down the inequality in y shown by the number line.

 $-1.5 \leq y < 4$ [2]

7

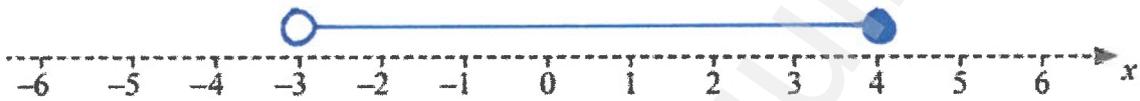


Write down the inequality for x represented on the number line.

$$\underline{-3 < x \leq 4} \quad [2]$$

3 Show this inequality on the number line.

$$-3 < x \leq 4$$



[2]

3 (a)



Write down the inequality shown by the number line.

$$\underline{-2 < x \leq 4} \quad [1]$$

(b) $-3 \leq 2x + 3 < 9$

(i) Solve the inequality.

$$-3 \leq 2x + 3 < 9$$

$$\begin{array}{ccc} -3 & & -3 \\ -6 & \leq & 2x < & 6 \end{array}$$

$$\begin{array}{ccc} \div 2 & & \div 2 & \\ -3 & \leq & x < & 3 \end{array}$$

$$\underline{-3 \leq x < 3} \quad [3]$$

(ii) Write down all the integer values of x that satisfy the inequality.

$$\underline{-3, -2, -1, 0, 1, 2} \quad [2]$$