

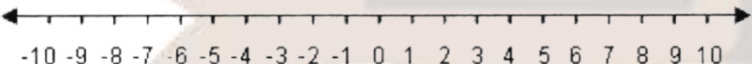


8 ESSENTIAL QUESTIONS TO MASTER

LINEAR EQUATIONS & SIMPLE INEQUALITIES

1	Solve the following equations. (a) $\frac{3y}{4} = -72$ (b) $5(y - 2) - 3(y + 1) = 15$	[2] [2]
2	Solve the following equations. (a) $5x + 8 = 3x - 7$ (b) $4(3y + 2) = 3(2 - y)$ (c) $\frac{2}{x+1} = \frac{3}{2x-5}$	[1] [2] [3]
3	Anna is y years old and Tom is 5 years older than her. Their mother is 4 times as old as Anna and their father is twice as old as Tom. Write down expressions, in terms of y , for (ai) Tom's age (aii) their father's age (b) Given that the sum of the ages of the four members of the family is 150, find Anna's age.	[1] [1] [2]
4	Solve each of the following equations. (a) $\frac{8-3x}{5} - \frac{3}{2} = 0$ (b) $\frac{1}{3-x} - \frac{4}{x+2} = 0$	[2] [2]
5	(a) It is given that $x = 3$ is the solution of the equation $12 - 5py = 7p - 6y$. Find the value of p . (b) Solve the equation $\frac{y-3}{5} = 2 - \frac{3y+7}{4}$.	[2] [3]
6	In a park, the number of visitors who entered the north gate is 4 times the number of visitors who entered the south gate. Let the number of visitors who entered the south gate be y . (a) Write an expression for the number of visitors who entered the north gate. (b) 15 visitors who entered the north gate now moved to the south gate. Express, in terms of y , (i) the number of visitors who entered the north gate after the move (ii) the number of visitors who entered the south gate after the move. (c) The number of visitors who entered the north gate and south gate are now the same. Form an equation in y to represent this information.	[1] [1] [1] [1]

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	(d) Solve the equation in (c) for y and thus find the number of visitors who entered the south gate after the move	[1]
7	(a) Express $\frac{7(x-3)}{5} - \frac{(2-3x)}{4}$ as a fraction with a single denominator. Hence, solve $\frac{7(x-3)}{5} - \frac{(2-3x)}{4} = 3$. (b) Given that $a=0.5$, $b=-3$ and $c=2\frac{3}{4}$, evaluate $\frac{10c}{a-b^2}$.	[4] [2]
8	(a) Solve $15 - 3x < x + 23$. (b) Show your solution on the number line below.  (c) State the smallest integer value of x .	[3] [1] [1]

Answer key:

1	(a) $3y = -72 \times 4$ $3y = -288$ $y = \frac{-288}{3} = -96$ (b) $5(y - 2) = 5y - 10$ and $-3(y + 1) = -3y - 3$ $5y - 10 - 3y - 3 = 15$ $2y - 13 = 15$ Add 13 to both sides: $2y = 28$ Divide by 2 to solve for y : $y = \frac{28}{2} = 14$	
2	(a) $5x - 3x + 8 = -7$ $2x + 8 = -7$ $2x = -7 - 8 = -15$ $x = \frac{-15}{2}$ (b) $4(3y + 2) = 12y + 8$ $3(2 - y) = 6 - 3y$ $12y + 8 = 6 - 3y$ $12y + 3y + 8 = 6$ $15y + 8 = 6$ $15y = 6 - 8 = -2$	



	$y = \frac{-2}{15}$ (c) $2(2x - 5) = 3(x + 1)$ $4x - 10 = 3x + 3$ $4x - 3x - 10 = 3$ $x - 10 = 3$ $x = 3 + 10 = 13$	
3	(a)(i) $y + 5$ (a)(ii) $2(y + 5) = 2y + 10$ (b) $y + (y + 5) + 4y + (2y + 10) = 150$ $8y + 15 = 150$ $8y = 135$ $y = \frac{135}{8} = 16.875$	
4	(a) $\frac{8-3x}{5} = \frac{3}{2}$ $2(8 - 3x) = 5 \times 3$ $16 - 6x = 15$ $-6x = -1$ $x = \frac{1}{6}$ (b) $(3 - x)(x + 2)$ $\frac{x + 2}{(3 - x)(x + 2)} \cdot \frac{4(3 - x)}{(3 - x)(x + 2)} = 0$ $x + 2 - 4(3 - x)$ $5x - 10 = 0 \text{ gives } x = 2$	
5	(a) $12 - 5py = 7p - 6y$ $12 - 15p = 7p - 18$ $22p = 30$ $P = \frac{30}{22} = \frac{15}{11}$ (b) $\frac{y-3}{5} = 2 - \frac{3y+7}{4}$ $4(y - 3) = 5(2) - 5\left(\frac{3y + 7}{4}\right)$ $4y - 12 = 10 - \frac{15y + 35}{4}$ $4(4y - 12) = 4(10) - 15y - 35$ $16y - 48 = 40 - 15y - 35$ $31y = 123$	

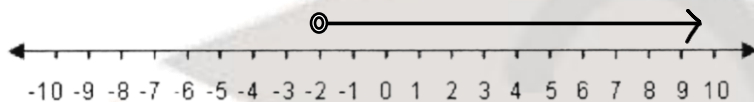


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	$y = \frac{123}{31} = \frac{41}{11}$	
6	(a) $4y$ (b)(i) $4y - 15$ (ii) $y + 15$ (c) $4y - 15 = y + 15$ (d) $3y - 15 = 15$ $3y = 30$ $y = 10$ $y + 15 = 10 + 15 = 25$	
7	(a) Least common denominator: 20 $\frac{7(x-3)-4}{20} - \frac{(2-3x)-5}{20}$ $\frac{28(x-3)-5(2-3x)}{20}$ $28x - 84 - 10 + 15x = 43x - 94$ $\frac{43x - 94}{20}$ $\frac{43x - 94}{20} = 3$ $43x - 94 = 60$ $43x = 154$ $x = \frac{154}{43}$ (b) $a - b^2 = 0.5 - (-3)^2 = 0.5 - 9 = 8.5$ $c = 2\frac{3}{4} = \frac{11}{4}$ $\frac{10 \times \frac{11}{4}}{-8 \cdot 5} = \frac{110}{34} = \frac{55}{17}$	
8	(a) $15 - 3x + 3x < x + 3x + 23$ $15 < 4x + 23$ $15 - 23 < 4x + 23 - 23$ $-8 < 4x$ $-2 < x$	



(b)



(c)

$$x = -1$$