

7 MUST KNOW QUESTIONS TO CONQUER

LINEAR EQUATIONS

1	Solve the following equations. (a) $\frac{2x}{3} = -54$, (b) $6(x - 1) - 2(x + 2) = 12$.	[2] [2]
2	Solve the following equations. (a) $4x + 7 = 2x - 9$ (b) $3(2y + 1) = 2(1 - y)$ (c) $\frac{1}{2z+1} = \frac{4}{3z-6}$	[1] [2] [3]
3	Mary is x years old and James is 8 years older than her. Their mother is 3 times as old as Mary and their father is twice as old as James. (a) Write down expressions, in terms of x , for (i) Jame's age, (ii) their father's age (b) Given that the sum of the ages of the four members of the family is 129, find Mary's age.	[1] [1] [2]
4	Solve each of the following equations. (a) $\frac{7-2x}{3} - 4x = -1$ (b) $\frac{2}{4-x} - \frac{5}{2x+3} = 0$	[2] [2]

5	<p>(a) It is given that $x = 2$ is the solution of the equation $10 - 3px = 6p - 4x$.</p> <p>Find the value of p.</p> <p>(b) Solve the equation $\frac{x-2}{4} = 1 - \frac{2x+5}{3}$.</p>	<p>[2]</p> <p>[3]</p>
6	<p>In a restaurant, the number of people who ordered Western food is 3 times the number of people who ordered Chinese food.</p> <p>Let the number of people who ordered Chinese food be x.</p> <p>(a) Write an expression for the number people who ordered Western food.</p> <p>(b) 20 people who ordered Western food now switched their order to Chinese food.</p> <p>Express, in terms of x,</p> <p>(i) the number of people who ordered Western food after the switch,</p> <p>(ii) the number of people who ordered Chinese food after the switch.</p> <p>(c) The number of people who ordered Western food and Chinese food are now the same. Form an equation in x to represent this information.</p> <p>(d) Solve the equation in (c) for x and thus find the number of people who ordered Chinese food after the switch.</p> <p>Ans: (a) $3x$ (bi) $3x - 20$ (ii) $x + 20$ (c) $x + 20 = 3x - 20$ (d) 40</p>	<p>[1]</p> <p>[1]</p> <p>[1]</p> <p>[1]</p> <p>[2]</p>
7	<p>(a) Express $\frac{5(x-2)}{4} - \frac{(1-2x)}{3}$ as a fraction with a single denominator.</p> <p>Hence, solve $\frac{5(x-2)}{4} - \frac{(1-2x)}{3} = 2$.</p> <p>(b) Given that $a = 0.3$, $b = -2$ and $c = 1\frac{4}{5}$, evaluate $\frac{8c}{a-b^2}$.</p> <p>Ans: (a) $x = 2\frac{12}{23}$ (b) $x = -3\frac{33}{37}$</p>	<p>[4]</p> <p>[2]</p>

Answer Key

1	<p>Solutions:</p> <p>(a) $\frac{2x}{3} = -54$ $2x = -108$ $x = -54$</p> <p>(b) $6(x - 1) - 2(x + 2) = 12$ $4x - 10 = 12$ $4x = 22$ $x = 5\frac{1}{2}$ or 5.5</p> <p>Ans: (a) $x = -54$ (b) $x = 5.5/5\frac{1}{2}$</p>
2	<p>Solutions:</p> <p>(b) $3(2y + 1) = 2(1 - y)$ $6y + 3 = 2 - 2y$ $8y = -1$ $y = -\frac{1}{8}$</p> <p>(c) $\frac{1}{2z+1} = \frac{4}{3z-6}$ $3z - 6 = 4(2z + 1)$ $3z - 6 = 8z + 4$ $5z = -10$ $z = -2$</p> <p>Ans: (a) $x = -8$ (b) $y = -\frac{1}{8}$ (c) $z = -2$</p>
3	<p>Solutions:</p> <p>(b) $x + x + 8 + 3x + 2x + 16 = -129$ $7x + 24 = 129$ $x = 15$</p> <p>Ans: (a) $(x + 8)$ years old (aii) $2x + 16$ years old (b) Mary's age is 15 years old.</p>
4	<p>Solutions:</p> <p>(a) $\frac{7-2x}{3} - 4x = -1$ $\frac{7-2x}{3} = -1 + 4x$ $7 - 2x = 3(-1 + 4x)$ $7 - 2x = -3 + 12x$ $10 = 14x$ $x = \frac{5}{7}$</p> <p>(b) $\frac{2}{4-x} - \frac{5}{2x+3} = 0$ $\frac{2}{4-x} = \frac{5}{2x+3}$ $2(2x + 3) = 5(4 - x)$ $4x + 6 = 20 - 5x$ $9x = 14$ $x = 1\frac{5}{9}$</p> <p>Ans: (a) $x = \frac{5}{7}$, (b) $x = 1\frac{5}{9}$</p>

5	<p>Solutions:</p> <p>(a) Sub $x = 2$ into equation, $10 - 3(2)p = 6p - 4(2)$ $12p = 18$ $p = \frac{3}{2}$ or $1\frac{1}{2}$ or 1.5</p> <p>(b) $\frac{x-2}{4} = 1 - \frac{2x+5}{3}$ $\frac{x-2}{4} = \frac{2x+5}{3} = 1$ $\frac{3(x-2)}{12} + \frac{4(2x+5)}{12} = 1$ $3x - 6 + 8x + 20 = 12$ $11x = -2$ $x = -\frac{2}{11}$</p> <p>Ans: (a) $1\frac{1}{2}$, (b) $-\frac{2}{11}$</p>
6	<p>Solutions:</p> <p>(d) $x + 20 = 3x - 20$ $2x = 40$ $x = 20$ $x + 20 = 40$</p> <p>Ans: (a) $3x$ (bi) $3x - 20$ (ii) $x + 20$ (c) $x + 20 = 3x - 20$ (d) 40</p>
7	<p>Solutions:</p> <p>(a) $\frac{5(x-2)}{4} - \frac{1-2x}{3}$ $= \frac{15(x-2) - 4(1-2x)}{12}$ $= \frac{15x - 30 - 4 + 8x}{12}$ $= \frac{23x - 34}{12}$ $= \frac{5(x-2)}{4} - \frac{1-2x}{3} = 2$ $= \frac{23x - 34}{12} = 2$ $= 23x - 34 = 24$ $x = 2\frac{12}{23}$</p> <p>(b) $\frac{8\left(1\frac{4}{5}\right)}{(0.3) - (-2)^2} = 2$ $= -3\frac{33}{37}$</p> <p>Ans: (a) $x = 2\frac{12}{23}$ (b) $x = -3\frac{33}{37}$</p>