

Given $x = \frac{t+4}{3t+1}$, find t in terms of x .

Q.1

	$x = \frac{t+4}{3t+1}$
multiply by $(3t+1)$	$x(3t+1) = t+4$
expand	$3xt + x = t + 4$
ts to LHS none ts to RHS	$3xt - t = 4 - x$
-x, -t	
factorise (HCF)	$t(3x-1) = 4-x$
$\div (3x-1)$	$t = \frac{4-x}{3x-1}$

Factorise (i) $a^3 + 8b^3$

(ii) $64c^3 - 125d^3$

Q.2

Sum of 2 cubes	
$x^3 + y^3 = (x+y)(x^2 - xy + y^2)$	$a^3 + 8b^3 = (a+2b)(a^2 - 2ab + 4b^2)$
$x^3 = a^3 \Rightarrow x = a$	
$y^3 = 8b^3 \Rightarrow y = 2b$	
Difference of 2 cubes	
$x^3 - y^3 = (x-y)(x^2 + xy + y^2)$	$64c^3 - 125d^3 = (4c - 5d)(16c^2 + 20cd + 25d^2)$
$x^3 = 64c^3 \Rightarrow x = 4c$	
$y^3 = 125d^3 \Rightarrow y = 5d$	

Solve the linear equation $\frac{2t-3}{5} + \frac{1}{20} = \frac{t-1}{4}$.

Q.3

<p>\times LCD ie..20</p> <p>expand and simplify</p> <p>ts to RHS +11, -5t nos to LHS</p> <p>$\div 3$</p>	$4(2t-3) + 1 = 5(t-1)$ $8t - 12 + 1 = 5t - 5$ $8t - 11 = 5t - 5$ $8t - 5t = -5 + 11$ $3t = 6$ $t = 2$
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Solve the simultaneous equations:

A: $x + y + z = 6$
 B: $2x + y - z = 1$
 C: $4x - 3y + 2z = 4$

Q.4

<p>Eliminate the zs</p> <p>\textcircled{A} $+$$\textcircled{B}$</p> <p>$\textcircled{C}$ $+$$2\textcircled{B}$</p> <p>Solve $\textcircled{1}$ and $\textcircled{2}$ Eliminate ys</p> <p>$\textcircled{1}$ $+$$2\textcircled{2}$</p> <p>Sub $x=1$ into $\textcircled{1}$</p> <p>Sub $x=1$ and $y=2$ into \textcircled{A}</p>	$\begin{array}{r} x + y + z = 6 \\ 2x + y - z = 1 \\ \hline 3x + 2y = 7 \end{array} \quad \textcircled{1}$ $\begin{array}{r} 4x - 3y + 2z = 4 \\ 4x + 2y - 2z = 2 \\ \hline 8x - y = 6 \end{array} \quad \textcircled{2}$ $\begin{array}{r} 3x + 2y = 7 \\ 16x - 2y = 12 \\ \hline 19x = 19 \end{array} \quad \Rightarrow x = 1$ $\begin{array}{r} 3(1) + 2y = 7 \\ 3 + 2y = 7 \\ 2y = 4 \end{array} \quad \Rightarrow y = 2$ $\begin{array}{r} 1 + 2 + z = 6 \\ 3 + z = 6 \end{array} \quad \Rightarrow z = 3$ <p>Intersection point $(1, 2, 3)$</p>
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