

14. If $\frac{a}{x-2} + \frac{b}{x+2} = \frac{4}{(x-2)(x+2)}$ for all values of x ,
using algebraic identities, write down two equations in terms of a and b only.
Hence solve for a and b .
Verify your answers using the original equation.

<p>Plan: x by LCD $(x-2)(x+2) = x^2 - 4$ D=TS</p> <p>IDENTITIES</p> <p>Solve ① and ②</p> <p>Sub $a=1$ into ①</p>	$a(x+2) + b(x-2) = 4$ $ax + 2a + bx - 2b = 4$ $(a+b)x + 2a - 2b = 0x + 4$ $a+b = 0 \quad \text{①}$ $2a - 2b = 4 \Rightarrow a - b = 2 \quad \text{②}$ $\begin{array}{r} \text{①} \\ + \text{②} \\ \hline 2a = 2 \end{array} \Rightarrow a = 1$ $1 + b = 0 \Rightarrow b = -1$
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18. A student studied a car rolling down an inclined plane and took measurements of its speed at two different times.
After 7 seconds, it had a speed of 2 m/sec and after 13 seconds, the speed increased to 5 m/sec.
Using the equation $v = u + at$, where v is the speed and t is the time, write down two linear equations in u and a .
Solve these equations to find values for u and a .

<p>$t = 7 \text{ s}$, $v = 2 \text{ m/s}$</p> <p>$t = 13 \text{ s}$, $v = 5 \text{ m/s}$</p> <p>Solve ① and ②</p> <p>Eliminate us</p> <p>Sub $a = \frac{1}{2}$ into ①</p>	$2 = u + a(7) \Rightarrow u + 7a = 2 \quad \text{①}$ $5 = u + a(13) \Rightarrow u + 13a = 5 \quad \text{②}$ $\begin{array}{r} u + 13a = 5 \\ - (u + 7a = 2) \\ \hline 6a = 3 \end{array} \Rightarrow a = \frac{1}{2} \text{ m/s}^2$ <p style="text-align: right; margin-right: 50px;"><small>in tables</small> ↓</p> $u + 13\left(\frac{1}{2}\right) = 5$ $u = 5 - \frac{13}{2} \Rightarrow u = -\frac{3}{2} \text{ m/s}$
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