Johnny and Bobby are working on painting a wall. When Johnny works alone, he can paint in
3 hours. When Bobby works alone, he can paint it in 2 hours. How long will it take the two of them together?

1) Introduce t as the variable that represents the time they need to complete the job.

2) Johnn's rate of work is $\dfrac{1}{3}$ This really means $\dfrac{1 wall}{3 hours}$

  2a) The part he completes is $\dfrac{1}{3}t$ rate of work multiplied by the time of work

3) Bobby's rate of work is $\dfrac{1}{2}$ This really means $\dfrac{1 wall}{2 hours}$

  3a) The part he completes is $\dfrac{1}{2}t$ rate of work multiplied by the time of work

4) The part that Johnny completes and the part that Bobby add to give the whole wall. The
whole in this content is represented using the number 1.

part done by Johnny + part done by Bobby = whole wall

$$\dfrac{1}{3}t + \dfrac{1}{2}t = 1$$

5) To solve this equation, find the lowest common multiple of 3 and 2.
multiples of 3: 3,6,9,12,...
multiples of 2: 2,4,6,8,...
The smallest number between the two lists is 6. This means you can multiply the equation in
step 4) by 6.

6) $6\left(\dfrac{1}{3}t + \dfrac{1}{2}t\right) = 6 \cdot 1$ setup the multiplication by 6

  $\dfrac{6}{3}t + \dfrac{6}{2}t = 6$ distribute the 6 over the terms inside the parenthesis

  2t+3t=6   perform the divisions

  5t=6   add like terms

  $t=\dfrac{6}{5}$ divide both sides by 5. This number is in hours.

7) To convert to minutes, change into mixed number form and write
$\dfrac{6}{5}hour = 1\dfrac{1}{5}hour = 1hour+\dfrac{1}{5}hour = 60minutes+\dfrac{1}{5}60minutes = 60minutes+12minutes = 72minutes$