Crew A can frame a house in 20 hours and crew B can frame the same house in 15 hours. Working together, how long will it take both crews to frame the house?
Answer

Let \( T \) = the time it will take both crews, working together, to do the whole job.

Crew A can do the whole job in 20 hours. In one hour they do \( \frac{1}{20} \) th of the job.

So, in \( T \) hours they do \( \frac{1}{20} \cdot T \) of the job.

Crew B can do the whole job in 15 hours. In one hour they do \( \frac{1}{15} \) th of the job.

So, in \( T \) hours they do \( \frac{1}{15} \cdot T \) of the job. As a result we can say that:

\[
\frac{1}{20} \cdot T + \frac{1}{15} \cdot T = 1
\]

\[
\frac{T}{20} + \frac{T}{15} = 1
\]

\[
\frac{T \cdot 3}{20 \cdot 3} + \frac{T \cdot 4}{15 \cdot 4} = 1
\]

\[
\frac{3T}{60} + \frac{4T}{60} = 1
\]

\[
\frac{7T}{60} = 1
\]

\[
7T = 60
\]

\[
T = 8\frac{4}{7} \text{ hours}
\]