DIRECTIONS: Solve.

1. \( \frac{5}{16} \) of \( \frac{4}{5} \) of a number is 15. Find the number.

   \[ \frac{5}{16} \times \frac{4}{5} = \frac{1}{4} \] 

   \[ \frac{1}{4} \times 15 = \frac{15}{4} = 3.75 \]

   \[ 3.75 \times 4 = 15 \]

   \[ 40 \]

2. 12 is \( \frac{3}{5} \) of \( \frac{10}{21} \) of a number. Find the number.

   \[ \frac{3}{5} \times \frac{10}{21} = \frac{6}{21} = \frac{2}{7} \]

   \[ \frac{2}{7} \times 12 = \frac{24}{7} \approx 3.43 \]

   \[ 42 \]

3. 30 is 20% of 30% of a number. Find the number.

   \[ 0.20 \times 0.30 = 0.06 \]

   \[ 30 \div 0.06 = 500 \]

   \[ 500 \]

4. 75% of 60% of a number is 36. Find the number.

   \[ 0.75 \times 0.60 = 0.45 \]

   \[ 36 \div 0.45 = 80 \]

   \[ 80 \]

5. Pump A can unload the petroleum from a ship in 30 hours and Pump B can unload it in 24 hours. Because of an approaching storm, both pumps were used on a certain ship. How long did they take (together) to empty the ship?

   \[ \frac{1}{30} + \frac{1}{24} = \frac{4}{120} + \frac{5}{120} = \frac{9}{120} = \frac{3}{40} \]

   \[ \frac{40}{3} \times 1 = 13 \frac{1}{3} \text{ hours} \]

   \[ 13 \text{ hours} 20 	ext{ minutes} \text{ or } 13 \frac{1}{3} \text{ hours} \]

6. An old conveyor belt takes 21 hours to move one day’s coal output from the mine to the rail line. A new belt can do it in 15 hours. How long does it take when both are used at the same time?

   \[ \frac{1}{21} + \frac{1}{15} = \frac{5}{105} + \frac{7}{105} = \frac{12}{105} = \frac{4}{35} \]

   \[ \frac{35}{4} \times 1 = 8 \frac{7}{4} \text{ hours} \]

   \[ 8 \text{ hours} 45 	ext{ minutes} \text{ or } 8 \frac{3}{4} \text{ hours} \]
7. How much pure antifreeze must be added to 12 liters of a 40% solution of antifreeze to obtain a 60% solution of antifreeze?

   6 liters

8. How much water must be evaporated from a 300-liter tank of a 2% salt solution to obtain a 5% solution?

   180 liters

9. A pharmacist wishes to make 1.8 liters of a 10% solution of boric acid by mixing 7.5% and 12% solutions. How much of each type of solution should be used?

   0.8 liters of 7.5% boric acid, 1 liter of 12% boric acid

10. How much of an 18% solution of sulfuric acid should be added to 360 mL of a 10% solution to obtain a 15% solution?

   600 mL

11. The county’s new asphalt paving machine can surface 1 km of highway in 10 hours. A much older machine can surface 1 km in 18 hours. How long will it take them to surface 21 km of highway if they start at opposite ends and work day and night?

   135 hours

12. Pipes A and B can fill a storage tank in 8 hours and 12 hours, respectively. With the tank empty, Pipe A was turned on at noon, and then Pipe B was turned on at 1:30 P.M. At what time will the tank be full?

   5:24 P.M.