In problems 1-12, solve the proportions by cross-multiplying:

1. \( \frac{5}{12} = \frac{x}{30} \)
2. \( \frac{-4}{5} = \frac{12}{a} \)
3. \( \frac{5m}{14} = \frac{6}{21} \)
4. \( \frac{1}{y+7} = \frac{8}{72} \)
5. \( \frac{18}{w+8} = \frac{2}{3} \)
6. \( \frac{4a-2}{3} = 2a \)
7. \( \frac{2x+1}{3} = \frac{5x-5}{6} \)
8. \( \frac{2e+9}{24} = \frac{e+1}{8} \)
9. \( \frac{y+5}{y+7} = -8 \)
10. \( \frac{c+12}{c+2} = 6 \)
11. \( \frac{3}{x} = \frac{x}{12} \)
12. \( \frac{8}{b} = \frac{b}{18} \)
13. \( \frac{k}{8} = \frac{3}{4k} \)
14. \( \frac{x+2}{5} = \frac{x+14}{x+3} \)
Use proportions to answer the following:

15. In three hours, 1,650 gallons were drained out of a swimming pool. At this rate, how many gallons will be drained out in 8 hours?

16. One of the heaviest rainfalls ever recorded occurred in Holt, Missouri, when 12 inches of rain fell in 42 minutes. At this rate, how much rain would fall in an hour?

17. A ranger caught, tagged, and released 150 deer in a state park. Three months later, the ranger caught 80 deer. Of these, 6 had tags. Based on these findings, estimate the total number of deer in the park.

18. If an animator needed to draw 3,600 frames for a 2½-minute cartoon, how many frames would be needed for a 6-minute cartoon?

Solve the following equations:

19. \[ \left( \frac{2}{3} \right)^2 = \frac{x}{54} \]

20. \[ \left( \frac{4}{5} \right)^3 = \frac{192}{x} \]

21. \[ \left( \frac{x}{5} \right)^2 = \frac{72}{200} \]

22. \[ \left( \frac{4}{x} \right)^3 = \frac{448}{1512} \]