DIRECTIONS: Solve the following equations for the variable $x$.

1. $\log_a x = \frac{3}{2} \log_a 9 + \log_a 2$
   \[ x = 54 \]

2. $\log_b (x^2 + 7) = \frac{2}{3} \log_b 64$
   \[ x = \pm 3 \]

3. $\log_a (3x + 5) - \log_a (x - 5) = \log_a 8$
   \[ x = 9 \]

4. $\log_3 (x + 2) + \log_3 6 = 3$
   \[ x = \frac{5}{2} \]

DIRECTIONS: Solve each equation. If needed, round to three decimal places.

5. $5^t = 10$
   \[ t \approx 1.431 \]

6. $5.6^x = 56$
   \[ x \approx 2.337 \]

7. $12^{2x} = 1000$
   \[ x \approx 1.390 \]

8. $3.5^{2t} = 60$
   \[ t \approx 1.634 \]

DIRECTIONS: Solve each equation without using a calculator or logarithms.

9. $3^x = \sqrt[5]{9}$
   \[ x = \frac{2}{5} \]

10. $125^x = 25\sqrt{5}$
    \[ x = \frac{5}{6} \]

DIRECTIONS: Solve each equation. If needed, round to three decimal places.

11. $x^{2/3} = 50$
    \[ x \approx 353.553 \]

12. $\sqrt[3]{x^4} = 60$
    \[ x \approx 21.558 \]

13. $\sqrt[5]{\frac{x}{9}} = 7$
    \[ x = 992,436,543 \]

14. $(3y - 1)^6 = 80$
    \[ y \approx 1.025 \]