Find a formula for $f^{-1}(x)$. Give the domain of $f^{-1}(x)$, including any restrictions “inherited” from f.

1. $f(x) = \frac{5x}{x-8}$

Expand each logarithm. Rewrite each expression as a sum, difference, or product of logs.

2. $\log \frac{2xy}{z}$
3. $\log (3xyz^2)^3$
4. $\ln \frac{3y}{\sqrt[4]{x}}$

For the following exercises, condense each expression to a single logarithm using the properties of logarithms.

5. $\ln x - \ln y + \ln z + \ln 3$

6. $3[\ln(x - 2) + 2 \ln(x + 1) - 5 \ln(x - 1)]$
Find the exact solution to the equation.

7. $\log_{10}(x - 3) = -1$ 
8. $9 \ln(x - 5) = 1$

9. $9^{7x} = 81$ 
10. $100 \left( \frac{x}{5} \right)^2 = 4$

Solve the equation.

11. $\log 2x = \log 5 + \log(x - 2)$

12. $\log(4 + x) - \log(x - 3) = \log 4$
Find an approximate solution to the equation. Round to 3 Decimal places.

13. \(2^x = 17\)  
14. \(e^{-0.15t} = 0.22\)

15. \(6 \ln(x + 2.8) = 9.6\)

Use your calculator to solve the equation between \(0 \leq \theta < 360\). Round your answers to the nearest tenth. You should have 2 answers.

16. \(\cos \theta = -0.874\)  
17. \(\sin \theta = 0.621\)
Math 3

Inverse Test Non – Calculator Review

Evaluate the logarithm

1. \( \log_4 256 \)
2. \( \log_6 \left( \frac{1}{36} \right) \)
3. \( \log_7 7^8 \)

Find the exact value of the function.

4. \( \cos \frac{17\pi}{6} = \)
5. \( \tan 690^\circ = \)

6. \( \sin 630^\circ = \)
7. \( \sin (-150)^\circ = \)

8. \( \cos \frac{-5\pi}{4} = \)
9. \( \tan \frac{-3\pi}{2} \)

Find the exact value of the expression in radians and degrees.

10. \( \sin^{-1} \left( \frac{1}{2} \right) \)
11. \( \cos^{-1} \left( -\frac{\sqrt{3}}{2} \right) \)

12. \( \tan^{-1} (-\sqrt{3}) \)
13. \( \sin^{-1} \left( -\frac{\sqrt{3}}{2} \right) \)
Find the exact value given the following information. Give your answer in radians or degrees.

14. \( \cos^{-1} \left( \tan \left( \frac{\pi}{4} \right) \right) \)  
15. \( \sin \left( \cos^{-1} \left( \frac{1}{2} \right) \right) \)  
16. \( \sin^{-1} \left( \cos \left( \frac{2\pi}{3} \right) \right) \)

Use Pythagorean Theorem to find the exact value.

17. \( \sin \left( \tan^{-1} \left( \frac{4}{3} \right) \right) \)  
18. \( \sin \left( \cos^{-1} \left( -\frac{1}{2} \right) \right) \)

Solve each equation between \( 0 \leq \theta < 360 \)

19. \( 4 \sin \theta + 2 = 2 \)  
20. \( \sin 3\theta = -\frac{1}{2} \)

21. \( \sin^2 \theta - 2 \sin \theta + 1 = 0 \)  
22. \( \tan^2 \theta + \tan \theta = 0 \)

23. \( -3 \tan \theta + 1 = 4 \)  
24. \( 4 \sin^2 \theta - 1 = 2 \)