

Name: _____

ID: A

6. (16 points) Solve for x . Justify with clear and complete work.

a. $\log_3 [\log_2(x-2) + \log_2(x)] = 1$ b. $\log(x-1) + 2\log(x) - \log(x^3 - 4x - 5) = 0$

7. (8 points) Simplify each of the following.

a. $\frac{\sec^2(x) - 1}{\tan(x)}$

b. $\sin(x) [\tan(x) + \cot(x)]$

8. (10 points) Find exact values for the following. Justify with clear and complete work.

a. $\log_b^3(b\sqrt{b})$

b. $9^{\log_{\sqrt{3}}(4)}$

9. (12 points) Find all possible values for the following. Where applicable, for angles in the interval $[0, 2\pi)$

a. $\sin\left(\sin^{-1}\left(\frac{5}{13}\right)\right)$

b. $\sin^{-1}\left(\cos\left(\frac{43\pi}{11}\right)\right)$

c. $\cos^{-1}\left(\cos\left(\frac{43\pi}{11}\right)\right)$

d. $\cos\left(\sin^{-1}\left(\frac{-4}{5}\right)\right)$

10. (15 points) If $\sin(\theta) = \frac{-1}{6}$ and $\theta \in \left(-\frac{\pi}{2}, \frac{\pi}{2}\right)$, then find the exact values for:

a. $\cos(\theta)$

b. $\sin(\theta + \pi)$

c. $\tan(-\theta)$

d. $\cos\left(\theta - \frac{\pi}{2}\right)$

g. Find an angle β , expressed in terms of θ , for which $\cos(\beta) = \frac{1}{6}$, $\sin(\beta) < 0$ and $\beta \in [0, 2\pi)$

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11. (20 points) Find all of the values of x for which the following are true. Justify with clear and complete work.

a. $\cos(2x) - 3\sin(x) + 1 = 0$

b. $\cos^2(2x) = 2\cos(2x)$

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