USF Math 108 Final Sample Problems

Simplify

1. $\dfrac{\left(3xy^2z\right)^2}{yz^{-2}}$

Simplify but leave as an exact answer

2. $\dfrac{\sqrt{5^2 \cdot 6^3}}{\sqrt{3^2 \cdot 5}}$

3. Solve this inequality $\left|3x+4\right| < 7$

4. What are the roots of this function $f\left(x\right) = x^4 - 5x^2 + 2$

5. Divide using long or synthetic division $\dfrac{x^5 - x^4 + x^3 + 4}{x-2}$

6. Are the following functions even, odd, both or neither
   a) $f\left(x\right) = 3x^2 + 1$
   b) $f\left(x\right) = x\cos x$

7. What is the remainder when $x^{16} - 2x^{15} + 5$ is divided by $x-2$

8. What are all the **possible** rational roots of $f\left(x\right) = 5x^4 - 3x^3 + 2x^2 - x + 1$

9. Find all the roots (real or complex) of $f\left(x\right) = x^5 - x^4 + 5x^3 - 5x^2$

10. Simplify: $\log_4 1$

11. Simplify: $\log_5 \dfrac{1}{125}$

12. Simplify: $\log_6 8 + \log_6 9 - \log_6 2$

13. Solve for x $\log_5 3x + 2 = 4$

14. Graph the function $f\left(x\right) = 2^x - 1$

13. What are the domain, range, period and amplitude of $f\left(x\right) = 3\sin\left(2x\right) + 4$? Graph the function.

14. Put in the form $a+bi$, $\dfrac{3+2i}{5-i}$

15. Convert 80° to radians

16. Find the exact value of
    a) $\cos 120^\circ$
    b) $\tan 390^\circ$
    c) $\sec^{-} 45^\circ$
    d) $\sin \dfrac{7\pi}{4}$

17. Solve the following triangles. Keep the solutions exact when possible.
    a) $a=10, b=15, \angle c=90^\circ$
    b) $a=5, b=7, \angle c=45^\circ$
    c) $a=9, b=11, c=15$
    d) $a=10, b=14, \angle A=30^\circ$

18. Verify the identity $\dfrac{\sec x}{\cos x}-\dfrac{\tan x}{\cot x}=1$

19. Find the exact value of $\cos\left(15^\circ\right)$

20. Solve this equation $6\sin^2 x-5\sin x+1=0$