

Final Exam Review #6

1. Factor each of the following completely:
a. $9xy^{20} - 81xz^{12}$ b. $a^3 - 125$ c. $4x^2 - 18x + 20$

2. Expand: $(x^2 + y^3)^4$

3. Find the inverse of the function $f(x) = 3x^3 + 2$ in the form of $f^{-1}(x)$.

4. Determine the number of relative extrema and zeros of the function $f(x) = 3x^8 - 2x^3 + 9x^2 + 1$

5. Determine if $(3x + 2)$ is a factor of $(11x + 20x^2 + 12x^3 + 2)$, by using long division. Explain your answer.

6. Simplify with positive exponents: $\left(\frac{9a^2b^{-3}c}{81a^6b^{-4}c^3}\right)^{-2}$

7. Condense: $2(\ln x + 4 \ln y) - 5 \ln z$

8. Complete the square to find the standard form of the ellipse. Find the center, foci and endpoints of the major and minor axis.
 $4x^2 + 9y^2 + 32x - 36y + 64 = 0$

9. Rewrite the each function as a positive acute angle.
a. $\tan -340^\circ$ b. $\csc -295^\circ$ c. $\cos 245^\circ$

10. Verify: $\frac{\csc x - \sin x}{\sin x \csc x} = \csc x - \sin x$

11. Solve for x: $\log_5(x^2 - 4) + \log_5 4 = 1$

12. Using the difference quotient $f'(x) = \lim_{h \rightarrow 0} \frac{f(x+h) - f(x)}{h}$
 - a. Find the derivative, $f'(x)$ of $f(x) = 2x^3 - x^2$.

 - b. Find the equations of the tangent line and the normal line at $x = 4$