1) Given \( f(x) = x^3 - x^2 \), find \( \frac{f(x+h) - f(x)}{h} \), where \( h \neq 0 \).

2) Given \( g(x) = \frac{1}{x+3} \), find \( \frac{g(x) - g(a)}{x-a} \), where \( x \neq a \).

3) Simplify \( \frac{1}{2}(2x+4)^{-\frac{1}{2}}(2)(3x^2 + 2)^3 + (2x+4)^{\frac{1}{2}}(3)(3x^2 + 2)^2(6x) \) completely.

4) Graph \( y = \ln(x+2) - 4 \). State the domain, the x- and y-intercepts, and any asymptotes.

5) Graph \( f(x) = (x+2)(x-3)^2(x+4)^3 \). State the x- and y-intercepts.

6) Solve \( \frac{2x^2 - 8}{x^2 - 16} \geq 0 \)

7) Graph \( f(x) = \frac{2x^2 + 10x + 12}{x^2 - 1} \). State the domain, the x- and y-intercepts, any asymptotes, and any holes.

8) Solve \( \log_2(x + 3) + \log_2(x - 3) = 4 \)

9) There are 10 bacteria in a culture now. In 5 hours, there will be 100 bacteria in the culture. Assuming that the bacteria population follows the law of exponential growth:
   a) Find the exponential growth function that models bacteria population \( t \) hours from now.
   b) After how many hours will there be 1,000,000 bacteria in the culture?

10) If \( \csc \theta = \frac{5}{3} \), where \( \theta \) is in quadrant II, find the exact value of the following:
   a) \( \sin \theta \)  
   b) \( \cos \theta \)  
   c) \( \tan \theta \)
11) Find the exact value of the following:
   a) \( \cos 270° \)  
   b) \( \sin^{-1} \left( \frac{\sqrt{3}}{2} \right) \)  
   c) \( \tan 135° \)  
   d) \( \csc \left( \frac{5\pi}{3} \right) \)

12) Graph \( y = 3\sin(2x - \pi) \) over one period. State the amplitude, the period, the phase shift, and the x- and y-intercepts.

13) Find all of the solutions of \( \sin(3x - \frac{\pi}{2}) = \frac{-\sqrt{3}}{2} \)

14) Find all of the solutions of \( \cos^2 x - 3\cos x + 2 = 0 \)

15) Find the equation of the following lines in slope intercept form:
   a) passing through \((-1, 2)\) and \((3, -5)\)
   b) passing through \((-2, -4)\) and parallel to \(4x + 5y = 8\)
   c) passing through \((3, 0)\) and perpendicular to \(4x = 4y - 25\)

16) Graph \( y = -2e^{x-1} + 4 \). State any intercepts and asymptotes.