

UNIT TEST **Lessons 1-7** (100 points possible)

I. Graph each of the following. Label your graphs. (8 points each)

1. $f(x) = |x| - 1$

2. $f(x) = 2 \cos(x)$

3. $4x^2 + 8x + y^2 = 12$

4. $f(x) \begin{cases} e^x & \text{for } x > 0 \\ \frac{1}{x} & \text{for } x < 0 \end{cases}$

5. $x^2 - y^2 = 4$

6. $f(x) = x^2 + 1$

II. Are all of the problems in section I functions? Explain. (5 points)

III. Do any of the functions in section I have a discontinuity? Explain. (5 points)

IV. Graph the solution on the real number line. (5 points)

$$|x - 2| \geq 1$$

V. Evaluate the following limits. (5 points each)

1. $\lim_{x \rightarrow \infty} 3^x =$

2. $\lim_{x \rightarrow 2} \frac{x^2 + x - 6}{x - 2} =$

3. $\lim_{x \rightarrow 0} [\cos(x) - 3\sin(x)] =$

VI. Find the inverse of $f(x) = 3x + 2$. (6 points)

VII. Evaluate. (5 points each)

1. $\cos\left(\frac{2\pi}{3}\right) =$

2. $\cot\left(\frac{3\pi}{4}\right) =$

VIII. Solve for x. (6 points)

$$e^{3x+1} = 2$$