

Name: KEY

PRACTICE FINAL – Math 105 – Fall 2007
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This exam contains 10 problems, worth a total of 100 points. For the first 6 problems I will give no partial credit, just write your final answer in the corresponding box. For the last 4 problems write out complete solutions and circle or box your answers. The use of books, calculators, cell phones, computers, notes, cheat sheets, and all similar aids is strictly prohibited.

1. When is $2x(1 - 2x)(1 - x) < 0$?

$$\boxed{(-\infty, 0) \cup (\frac{1}{2}, 1)}$$

	0	$\frac{1}{2}$	1	
$2x$	-	+	+	+
$1-2x$	+	+	-	-
$1-x$	+	+	+	-

2. Find the inverse of $f(x) = \frac{2x + 1}{1 - x}$

$$\boxed{f^{-1}(x) = \frac{x-1}{x+2}}$$

$y = \frac{2x+1}{1-x} \Rightarrow y(1-x) = 2x+1$
 $\Rightarrow y - yx = 2x+1 \Rightarrow y-1 = yx+2x = (y+2)x \Rightarrow x = \frac{y-1}{y+2}$

3. If $\sqrt{4e^{-2x}}2e^{2x} = 1$, then $x =$

$$\boxed{\ln \frac{1}{4}}$$

$2e^{-x} \cdot 2e^{2x} = 1 \Rightarrow e^x = \frac{1}{4} \Rightarrow x = \ln \frac{1}{4}$

4. $\ln \frac{2}{x} + 2 \ln(x) - \ln(1 - x) = 0$ implies $x =$

$$\boxed{\frac{1}{3}}$$

$\ln\left(\frac{2}{x} \cdot x^2 \cdot \frac{1}{1-x}\right) = 0 \Rightarrow \frac{2x}{1-x} = 1 \Rightarrow 2x = 1-x \Rightarrow 3x = 1$

5. $\lim_{n \rightarrow \infty} \left(1 + \frac{0.3}{n}\right)^{2n} =$

$$\boxed{e^{0.6}}$$

$\left(1 + \frac{1}{n/0.3}\right)^{\frac{2n}{0.3} \cdot 0.3} = \left[\left(1 + \frac{1}{n/0.3}\right)^{n/0.3}\right]^{0.6} \rightarrow e^{0.6}$

6. $\sin \frac{5\pi}{6} =$

$$\boxed{\frac{1}{2}}$$

