**Name**_____

**SCIENTIFIC CALCULATOR PERMITTED**

**II. Answer each question in this part. Show all work. All answers must be in simplest radical form.**

1. State the domain of $f(x)=\log_7(8-5x)$. (3 pts.)

2. Find the image of $(-4,1)$ under each transformation.

(a) $r_{y-axis}$ _____ (2 pts.)

(b) $R_{0,270^\circ}$ _____ (2 pts.)

(c) $T_{(-1,3)} \circ r_{y=-x}$ _____ (3 pts.)

(d) $r_{x=-2}$ _____ (2pts.)

3. Solve for $x$: $\log_5 x+\log_5(x-6)=2\log_5 4$. (6 pts.)

4. If $\cos\theta=-\frac{\sqrt{5}}{3}$ and $\tan\theta>0$, state the value of

(a) $\sin\theta$ (4 pts.)

(b) $\cot\theta$ (2 pts.)

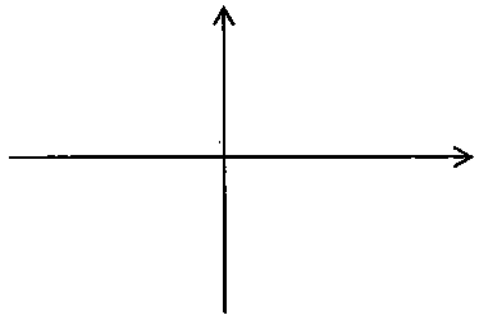
5. Express each of the following as a function of a positive acute angle. (2 pts. each)

(a) $\sin 545^\circ$

(b) $\tan(-20^\circ)$

6. Sean invests \$7500 in an account that pays 4.86% per year compounded monthly. How long will it take for his investment to grow to\$15,525 ? (6 pts.)

7. (a) If $f(x) = -3^x$ sketch the graph of $y = f(x)$ on the axes below. Identify the y-*intercept*. (3 pts.)



(b) State the range of $f$. _____ (2 pts.)

(c) Find an equation of the inverse of $f$. (3 pts.)

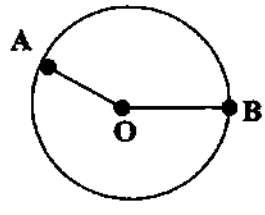
8. Solve for $x$: $\sqrt{2}^{x+1} = \left(\frac{1}{8}\right)^{x+1}$. (4 pts.)

**III. Multiple Choice. Write the letter of the best choice in the space provided. (2 pts. each)**

_____ 1. The y-intercept of the graph of $y = 2^x - 3$ is

(a) $-3$ (b) $-2$ (c) $\frac{\log 2}{\log 3}$ (d) $\frac{\log 3}{\log 2}$

_____ In circle $O$ the $m\angle AOB$ is 3 radians and the length of $\overset{\frown}{AB}$ is the circle is $4.2cm$. What is the area of sector AOB?




(a) $26.46cm^2$ (b) $2.94cm^2$ (c) $1.5cm^2$ (d) None of these

_____ Which of the following represents $240°$ in radians?

(a) $\frac{\pi}{3}$ (b) $\frac{9\pi}{4}$ (c) $\frac{4\pi}{3}$ (d) $-\frac{\pi}{3}$

NO CALCULATOR

Name_____

**I. Answer each question in this section. Show all work. As necessary, use simplest radical form for all final answers. Good Luck!**

**1 -3. Simplify. If an expression does not name a real number, write *non-real*. (1 pt. each)**

| | | |
|---|---|---|
| 1. $\log_{\frac{1}{3}} 27$ | 2. $125^{\frac{2}{3}}$ | 3. $10^{\log\sqrt{3}}$ |

**4 - 7. State the exact value of each expression. If an expression is undefined, so state.**

| | |
|---|---|
| 4. $\cos 225^\circ$ (2 pts.) | 5. $\tan 120^\circ$ (2 pts.) |
| 6. $\sec(-120)^\circ$ (3 pts.) | 7. $\sin 540^\circ$ (2 pts.) |

8. Solve for $x$: $\log_x 4 = -\frac{2}{3}$. (3 pts.)

9. Evaluate: $3^{\log_6 9 + \log_6 4}$. (3 pts.)

**Please detach this page and turn it in before moving on to the next page.**