What month is your birthday ?   __ __
What are the first 2 digits of your address ?   __ __
What are the last 2 digits of your zip code ?   __ __
What are the last 2 digits of your social security number ?   __ __
[IF YOU DO NOT HAVE A SOCIAL SECURITY NUMBER,
USE YOUR STUDENT ID NUMBER]

NO CALCULATORS ALLOWED – FINAL ANSWERS MAY USE π

MULTIPLE CHOICE: Which of the quantities $\cos 3$, $\tan 4$, and $\sin 6$ is/are positive ?   SCORE: ___ / 2 POINTS

[A]   none of the quantities are positive
[B]   only $\tan 4$ is positive
[C]   only $\tan 4$ and $\sin 6$ are positive
[D]   all of the quantities are positive

LETTER OF CORRECT ANSWER: B

Fill in the circular function values.   SCORE: ___ / 4 POINTS

$\sin \dfrac{\pi}{3} = \dfrac{\sqrt{3}}{2}$ $\tan \dfrac{\pi}{2} = UNDEF$ $\cos \dfrac{\pi}{4} = \dfrac{\sqrt{2}}{2}$ $\csc \dfrac{\pi}{6} = 2$

Find the circular function values.   SCORE: ___ / 3 POINTS

$\sin \dfrac{7\pi}{4} = -\dfrac{\sqrt{2}}{2}$ $\cos \dfrac{5\pi}{6} = -\dfrac{\sqrt{3}}{2}$ $\tan \dfrac{4\pi}{3} = \sqrt{3}$

Find the exact value of s in $\left[\dfrac{3\pi}{2}, 2\pi\right]$ such that $\sin s = -\dfrac{1}{2}$.   SCORE: ___ / 1 POINTS

$$2\pi - \dfrac{\pi}{6} = \dfrac{11\pi}{6}$$

Find the exact value of s in $\left[\pi, \dfrac{3\pi}{2}\right]$ such that $\cos s = -\dfrac{\sqrt{2}}{2}$.   SCORE: ___ / 1 POINTS

$$\pi + \dfrac{\pi}{4} = \dfrac{5\pi}{4}$$

Convert $54°$ to radians. Simplify your answer. **SHOW ALL CALCULATIONS USED.**   SCORE: ___ / 1 POINTS

$$\overset{3}{\cancel{54°}} * \dfrac{\pi^r}{\underset{10}{\cancel{180°}}} = \dfrac{3\pi^r}{10}$$

If Mario eats $\dfrac{2\pi}{5}$ radians of a pizza with radius 10 inches, what is the area of the pizza he eats ?
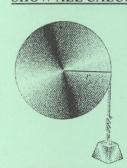
SHOW ALL CALCULATIONS USED.

$$A = \tfrac{1}{2}r^2\theta$$
$$= \tfrac{1}{2}(10\,in)^2\,\tfrac{2\pi}{5}$$
$$= \tfrac{1}{2}(\overset{20}{100}\,in^2)\,\tfrac{2\pi}{5}$$
$$= 20\pi \cdot in^2$$

MARIO EATS 20π in^2
OF PIZZA

A thread is being pulled off a spool at the rate of 50 cm per sec. Find the radius of the spool if it makes 250 revolutions per minute. **SHOW ALL CALCULATIONS USED.**

$$\frac{250\ revs}{min} * \frac{2\pi^r}{1\,rev} = \frac{500\pi^r}{min}$$

$$V = r\omega$$

$$r = \frac{V}{\omega} = \frac{50\,cm}{sec} \times \frac{min}{\underset{10}{500\pi^r}} \times \frac{\overset{6}{60\,sec}}{1\,min}$$

$$= \frac{6}{\pi}\,cm$$

THE RADIUS IS $\dfrac{6}{\pi}$ cm

Find the radius of the pulley below if a rotation of $84°$ raises the weight 10 cm.
SHOW ALL CALCULATIONS USED.

$$\overset{7}{84°} * \frac{\pi^r}{\underset{15}{180°}} = \frac{7\pi^r}{15}$$

$$S = r\theta$$

$$r = \frac{S}{\theta}$$

$$= \frac{10\,cm}{\frac{7\pi}{15}}$$

$$= 10\,cm * \frac{15}{7\pi} = \frac{150}{7\pi}\,cm$$

THE RADIUS IS $\dfrac{150}{7\pi}$ cm