

Problem 1

What is the greatest possible value of f if

$$f(x) = \frac{8 \sin 2x}{2} - \frac{1}{2}?$$

--	--	--	--

Problem 2

If $\cos\left(\frac{\pi}{3}\right) = a$, what is the value of $\left(\frac{a}{3}\right)^2$?

--	--	--	--

Problem 3

If $(\sin x - \cos x)^2 = 0.83$, what is the value of $(\sin x + \cos x)^2$?

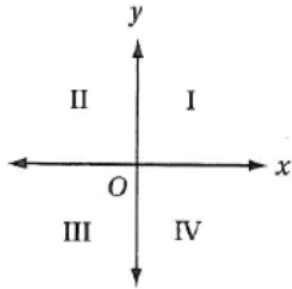
--	--	--	--

Problem 4

Which of the following is equivalent to $\frac{\sin\left(\frac{\pi}{6}\right)}{\cos\left(\frac{\pi}{3}\right)}$?

- A) $\frac{1}{\sqrt{6}}$ B) $\frac{1}{\sqrt{3}}$ C) $\frac{\sqrt{3}}{\sqrt{2}}$ D) 1

Problem 5



If $\sin \theta < 0$ and $\sin \theta \cos \theta < 0$, then θ must be in which quadrant of the figure above?

- A) I B) II C) III D) IV

Problem 6

If $\sin x = \frac{a}{b}$ and $0 < x < \frac{\pi}{2}$, which of the following expressions is equal to $\frac{b}{a}$?

- A) $\sin\left(\frac{1}{x}\right)$
 B) $\frac{1}{\cos\left(\frac{\pi}{2} - x\right)}$
 C) $1 - \sin^2 x$
 D) $\sin\left(\frac{\pi}{2} - x\right)$

Problem 7

If $\sin b = a$, which of the following could be the value of $\cos(b + \pi)$?

- A) $\sqrt{a^2 - 1}$
 B) $a^2 - 1$
 C) $-\sqrt{1 - a^2}$
 D) $1 - a^2$

Problem 8

If $0 < x < \frac{\pi}{2}$ and $\frac{\cos x}{1 - \sin^2 x} = \frac{3}{2}$, what is the value of $\cos x$?

- A) $\frac{1}{9}$
 B) $\frac{1}{3}$
 C) $\frac{4}{9}$
 D) $\frac{2}{3}$