

1. On the accompanying grid, sketch the graphs of  $y = \tan x$  and  $y = \cos \frac{1}{2}x$  for values of  $x$  in the interval  $-2\pi \leq x \leq 2\pi$ , and state how many values of  $x$  in the interval  $-2\pi \leq x \leq 2\pi$  are solutions of the equation  $\tan x = \cos \frac{1}{2}x$ .



1.

2. If the minute hand of a clock measures 6 inches, how long is the arc traced by this hand from 1:00 to 1:30?

3. What is the image of (3, 2) under a counterclockwise rotation of  $\pi$  radians?  
 (1) (2, 3)                      (3) (-3, 2)  
 (2) (2, -3)                    (4) (-3, -2)

2.

3.

4. Find the exact value of each expression in simplest form.

a  $\cot 420^\circ$

b  $(\sec 150^\circ)(\cos 150^\circ)$

c  $(\sin \frac{\pi}{2})(\tan \frac{\pi}{6}) - (\tan \frac{\pi}{4})(\cos \frac{\pi}{2})$

d  $\cos \frac{11\pi}{6} - \cot \frac{5\pi}{3}$

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4.       

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5. If  $\sin(2\theta + 18) = \cos(5\theta - 12)$ , which of the following pairs of angles are represented in this equation?

- (1)  $42^\circ, 48^\circ$                       (3)  $12^\circ, 68^\circ$   
 (2)  $38^\circ, 52^\circ$                     (4)  $45^\circ, 45^\circ$

6. If  $x = \frac{a\sqrt{b}}{cd}$ , which expression is equivalent to  $\log x$ ?

- (1)  $\log a + \frac{1}{2} \log b - \log c + \log d$   
 (2)  $\log a - \frac{1}{2} \log b - \log c + \log d$   
 (3)  $\frac{1}{2} \log a + \frac{1}{2} \log b - \log c + \log d$   
 (4)  $\log a + \frac{1}{2} \log b - \log c - \log d$

5.

6.