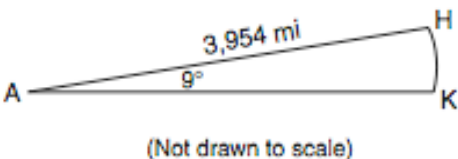


<p>1. a. Find the exact value of <math>\tan 225^\circ</math>.                  b. Find the exact value of <math>\sin 330^\circ</math>.</p>	<p>2. In which quadrant(s) does the graph of <math>y = \frac{-8}{x}</math> lie?</p>
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1. \_\_\_\_\_  
 2. \_\_\_\_\_

<p>3. Cities <math>H</math> and <math>K</math> are located on the same line of longitude and the difference in the latitude of these cities is <math>9^\circ</math>, as shown in the accompanying diagram. If Earth's radius is 3,954 miles, how many miles north of city <math>K</math> is city <math>H</math> along arc <math>HK</math>? Round your answer to the nearest tenth of a mile.</p>  <p style="text-align: center;">(Not drawn to scale)</p>
--

3. \_\_\_\_\_

<p>4. Solve for <math>x</math>: <math>\frac{1}{2} \log(x + 2) = 2</math></p>	<p>5. Solve for <math>x</math> to the nearest hundredth:  <math>5x^{0.789} = 22</math></p>
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4. \_\_\_\_\_  
 5. \_\_\_\_\_

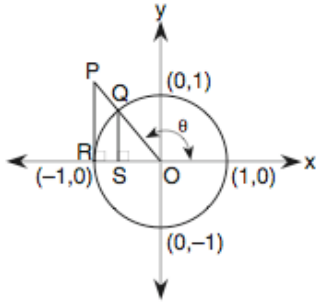
<p>6. If <math>\csc A = \frac{\sqrt{5}}{2}</math> and <math>\cos A &lt; 0</math>, find the exact value of each in <i>simplest radical form</i>.</p> <p>a. <math>\sec A</math>                  b. <math>\cos A</math>                  c. <math>\sin A</math>                  d. <math>\tan A</math>                  e. <math>\cot A</math></p>
---

6. \_\_\_\_\_

<p>7. The expression <math>\log \frac{\sqrt{xy}}{w}</math> is equivalent to</p> <p>(1) <math>\frac{2 \log xy}{\log w}</math>                  (2) <math>\log x + \log y - \log w</math>                  (3) <math>\frac{1}{2}(\log x + \log y) - \log w</math>                  (4) <math>\frac{1}{2}(\log xy - \log w)</math></p>	<p>8. Which transformation is an example of an opposite isometry?</p> <p>(1) <math>(x, y) \rightarrow (x + 3, y - 6)</math>                  (2) <math>(x, y) \rightarrow (3x, 3y)</math>                  (3) <math>(x, y) \rightarrow (y, x)</math>                  (4) <math>(x, y) \rightarrow (y, -x)</math></p>
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7. \_\_\_\_\_  
 8. \_\_\_\_\_

9. In the accompanying diagram,  $\overline{PR}$  is tangent to circle  $O$  at  $R$ ,  $\overline{QS} \perp \overline{OR}$ , and  $\overline{PR} \perp \overline{OR}$



Which measure represents  $\sin \theta$ ?

- (1)  $SO$                       (3)  $PR$   
 (2)  $RO$                       (4)  $QS$

9.

10. The amount,  $A$ , in grams, of a 32 gram serving of caffeine remaining in the body after  $t$  hours is given by the formula:  $A = 9(1.6)^t$ . Find, to the nearest tenth of an hour, how long it takes for half of the caffeine dose to leave the body.

10.

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

- (1)  $(2, 3)$                       (3)  $(-3, 2)$   
 (2)  $(2, -3)$                       (4)  $(-3, -2)$

12. 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?

11.

12.

13. If  $\csc \theta = -\frac{2\sqrt{5}}{3}$  and  $\cot \theta < 0$ , find  $\cos \theta$ .

13.

14. 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)  $\log a + \frac{1}{2} \log b - \log c - \log d$

14.