PreCalculus '13-14 Name: Solution Key
Dr. Quattrin
Trig Basics
CALCULATOR ALLOWED Score _____
Round to 3 decimal places.

Round to 3 decimal places. Show all work.

1. $\sin\left(\cos^{-1}\frac{3}{4}\right)=$

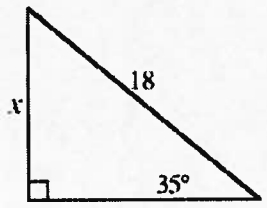
a. 0.438 b. 0.661 c. 0.821

d. 1.3238 e. 1.528

2. The magnitude of $\vec{v}=7\vec{i}-\sqrt{6}\vec{j}$ is $|\vec{v}| = \sqrt{7^2+(\sqrt{6})^2} = \sqrt{49+6}$

a. $\sqrt{55}$ b. 1 c. 13 d. 85 e. $\sqrt{85}$

3. In the triangle shown, which of the following best approximates x?

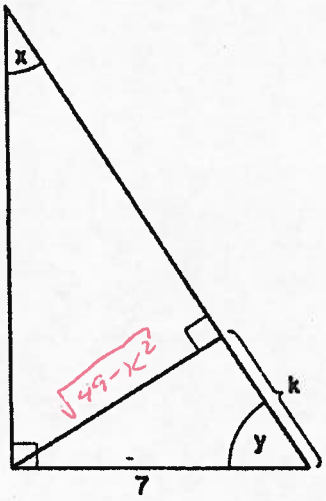


$\sin 35^\circ = \frac{x}{18}$

a. 10.32 b. 25.71 c. 12.60

d. 14.74 e. none of these

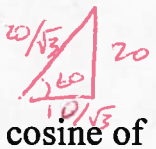
4. In the figure below, $\tan y =$



a. $\frac{7}{k}$ b. $\frac{k}{7}$ c. $\frac{7-k}{7}$ d. $\frac{\sqrt{49-k^2}}{7}$ e. $\frac{\sqrt{49-k^2}}{k}$

5. An incline makes an angle of 60° with level ground. How many feet up the incline must one go in order to rise 20 feet above the ground?

a. 10 b. $10\sqrt{3}$ c. $\frac{20}{\sqrt{3}}$ d. 40 e. $40\sqrt{3}$



6. What is the measure of an angle whose sine is twice the cosine of 60°?

a. 30° b. 60° c. 90°

d. 120° e. No such angle

$\cos 60 = 1/2$

$2\cos 60 = 1$

$\sin\theta = 1$

θ 90

PreCalculus 2013-14
Trig Basics Practice Test
Part II: CALCULATOR ALLOWED

Name Solution Key

Score_____

1. (-3, 5) is on the terminal side of A. Find the six exact trig values: $r=\sqrt{34}$

sin A= $5/\sqrt{34}$ cos A= $-3/\sqrt{34}$

tan A= $-5/3$ cot A= $-3/5$

sec A= $-\sqrt{34}/3$ csc A= $\sqrt{34}/5$

2. $\cos B = -5/7$ in Quadrant II. Find the other five exact trig values: $y=\sqrt{49-25}=\sqrt{24}$

sin B= $\frac{\sqrt{24}}{7}$ cos $B = -5/7$

tan B= $\frac{-\sqrt{24}}{5}$ cot B= $-5/\sqrt{34}$

sec B= $-7/5$ csc B= $7/\sqrt{24}$

3. $\cot C = -60/11$ in Quadrant IV. Find the other five exact trig values: $x=60 \quad y=-11$ $r=61$

sin C= $-11/61$ cos C= $60/61$

tan B= $-11/60$ cot $C = -60/11$

sec C= $61/60$ csc C= $-61/11$

4. Find the approximate values of A, B, and C (in degrees) above.

A= 120.964 ±360n

B= 135.585 ±360n

C= -10.389 ±360n

5. Find the approximate values of:

Cos -38°= .788

Sin 46°= .719

Tan 2.6= -.602

Sec -.937= 1.689

Csc 2.8°= 20.471

6. Find the approximate values (in degrees) of:

Cos^{-1} 1.725= { No Solution

Sin^{-1} (-.345)= { -20.182 ±360n
200.182 ±360n

Tan^{-1} 1.788= { 60.782 ±360n
240.782 ±360n

Sec^{-1} 2.082= { 61.295 ±360n
-61.295 ±360n

Csc^{-1} -1.362= { -47.241 ±360n
227.241 ±360n

7. A boat sails 63 mph at a bearing of 113°. The current flows 8 mph at 254°. Find the magnitude and bearing of the resultant vector.

$\vec{b} = 63\cos 113\,\vec{i} + 63\sin 113\,\vec{j}$

$\vec{c} = 8\cos 254\,\vec{i} + 8\sin 254\,\vec{j}$

~~$55.566\,\vec{i} - 2.584\,\vec{j}$~~ $-26.821\,\vec{i} + 50.302\,\vec{j}$

$|\vec{b}+\vec{c}| =$ ~~55.623~~ 57.066

~~$\theta = -\cos^{-1}\frac{55.566}{55.623} =$~~ $\theta = \cos^{-1}\frac{-26.821}{57.066} = 118.066°$

8. If $\vec{s} = -4\vec{i} + 7\vec{j}$ and $\vec{r} = 15\vec{i} + 8\vec{j}$, find:

a. $4\vec{s} - 3\vec{r} =$

$-16\vec{i} + 28\vec{j} - 45\vec{i} - 24\vec{j}$

$= -61\vec{i} + 4\vec{j}$

b. $|3\vec{s} + 4\vec{r}| = |48\vec{i} + 53\vec{j}|$

$= \sqrt{48^2 + 53^2} = \sqrt{5113} \approx 71.505$

c. The unit vector in the direction $\vec{r}$ $= \frac{\vec{r}}{|\vec{r}|} = \frac{15}{17}\vec{i} + \frac{8}{17}\vec{j}$

9. Find the exact value of the following:

$\sin\frac{3\pi}{4}\csc\frac{3\pi}{4}\tan\frac{5\pi}{6}$

$= \left(\frac{1}{\sqrt{2}}\right)\left(\frac{\sqrt{2}}{1}\right)\left(\frac{-1}{\sqrt{3}}\right)$

$= -1/\sqrt{3}$

$\frac{1}{\cos\frac{5\pi}{3} + \sin\frac{7\pi}{3}} + \frac{1}{\sin\frac{11\pi}{3} + \cos\frac{\pi}{3}}$

$= \frac{1}{\frac{1}{2} + \frac{\sqrt{3}}{2}} + \frac{1}{-\frac{\sqrt{3}}{2} + \frac{1}{2}}$

$= \frac{1}{\frac{1+\sqrt{3}}{2}} + \frac{1}{\frac{-\sqrt{3}+1}{2}} = \frac{4}{\sqrt{3}(+1)}$

$= \frac{2(-\sqrt{3}+1) + 2(1+\sqrt{3})}{1-3} = \boxed{-2}$