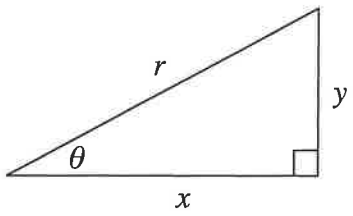
Precalculus Acc '22-23 Name SOLUTION KEY
Trig Basics Test v1
Part I--CALCULATOR ALLOWED

1. In the figure to the right, $\sin\theta\cos\theta =$



a) $\frac{x}{r}$ b) $\frac{y}{r}$ c) $\frac{y^2}{rx}$ d) $\frac{x^2}{ry}$ e) $\frac{xy}{r^2}$

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2. Which of the following is not a unit vector?

a) $\vec{v} = \frac{1}{3}\vec{i} - \frac{2}{3}\vec{j}$ b) $\frac{4}{5}\vec{i} + \frac{3}{5}\vec{j}$ c) $-\frac{5}{13}\vec{i} + \frac{12}{13}\vec{j}$

d) $\frac{\sqrt{41}}{21}\vec{i} + \frac{20}{21}\vec{j}$ e) $\frac{3}{5}\vec{i} - \frac{4}{5}\vec{i}$

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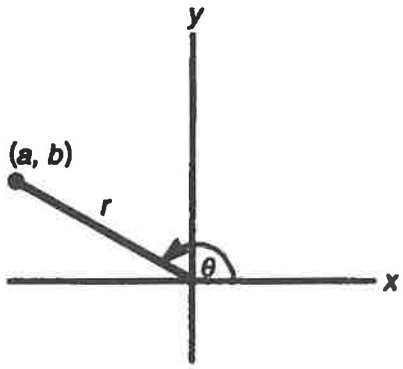
3. In the figure, $r(\sin\theta + \cos\theta)$ equals

$= r\sin\theta + r\cos\theta$

$= y + x$

a) a
b) b
c) $-a$
d) $-b$
e) $a+b$



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4. Simplify the expression $\cot\left(\cos^{-1}6x\right)$. ADJ = 6x OPP = $\sqrt{1-36x^2}$ HYP = 1

a) $\dfrac{6x}{\sqrt{1-6x^2}}$ b) $\dfrac{\sqrt{1-6x^2}}{6x}$ c) $\dfrac{6x}{\sqrt{1-36x^2}}$

d) $\dfrac{\sqrt{1-36x^2}}{6x}$ e) $\sqrt{1-36x^2}$

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5. The magnitude of $\vec{v}=7\vec{i}-\sqrt{6}\vec{j}$ is

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

$\sqrt{7^2+(\sqrt{6})^2}$ =

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6. If the terminal side of α passes through $(-9, -5)$, then $\cot\alpha =$ $\frac{-9}{-5}$

a) $-\frac{9}{5}$ b) $-\frac{5}{9}$ c) $-\frac{9}{\sqrt{106}}$ d) $\frac{5}{9}$ e) $\frac{9}{5}$

$r = \sqrt{81 + 25} = \sqrt{106}$

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7. If $\sec\theta = \frac{9}{2}$ and $\sin\theta < 0$, then $\tan\theta =$ $\frac{y}{x}$

a. $-\sqrt{77}$ b. $\frac{\sqrt{77}}{2}$ c. $\frac{\sqrt{77}}{9}$ d. $-\frac{\sqrt{77}}{2}$ e. $-\frac{\sqrt{77}}{9}$

$x = 2 \quad r = 9 \quad y = -\sqrt{81 - 4} = -\sqrt{77}$

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Trig Basics Test v1

Part II--CALCULATOR ALLOWED

1. ~~(9, -13)~~ (8, -15) is on the terminal side of A. Find the six **exact** trig values:

$\sin A =$ $-15/17$ $\csc A =$ $-17/15$

$\cos A =$ $8/17$ $\sec A =$ $17/8$

$\tan A =$ $-15/8$ $\cot A ==$ $-8/15$

2. If $\cos B = \frac{20}{21}$ in QIV, find the other five exact trig values:

$y = -11$

$\sin B =$ $-11/21$ $\csc B =$ $-21/11$

$\cos B = \frac{20}{21}$ $\sec B =$ $\frac{21}{20}$

$\tan B =$ $-11/20$ $\cot B ==$ $-20/11$

3. What are the approximate values, in degrees of A and B (from #1and #2)?

$A =$ $-61.928 \pm 360n$

$B =$ $-17.753 \pm 360n$

4. Find the approximate values of:

Cos 1.56 $\approx .011$

Sin -138= $.228$

Tan 1.45°= $.025$

Sec 32= 1.199

Csc -412°= -1.269

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

$\cos^{-1} .705 = \{ \pm 45.170 \pm 360n \}$

$\sin^{-1} (-0.326) = \{ -19.026 \pm 360n,\ 199.026 \pm 360n \}$

$\tan^{-1} 0.518 = \{ 27.384 \pm 360n,\ 207.385 \pm 360n \}$

$\sec^{-1} .982 = \{$ NO SOLUTION $\}$

$\csc^{-1} -1.362 = \{ -47.241 \pm 360n,\ 227.241 \pm 360n \}$

6. A boat sails 58 mph at a bearing of 173°. The current flows 10 mph at -84°. Find the magnitude and bearing of the resultant vector.

$58\cos 173\,\vec{i} + 58\sin 173\,\vec{j}$

$10\cos(-84)\,\vec{i} + 10\sin(-84)\,\vec{j}$

$-56.522\,\vec{i} - 2.877\,\vec{j}$

$|\vec{r}| = 56.596 \text{ mph}$

$\theta = -\cos^{-1}\left(\frac{-56.522}{56.596}\right) = -177.086°$