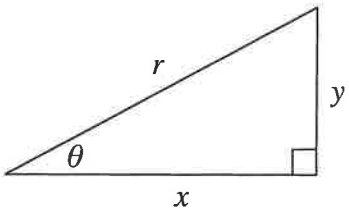
Honors Precalculus '22-23 Name Solution Key
Trig Basics Test v1
Part I--CALCULATOR ALLOWED

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



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

---

2. Which of the following is a unit vector?

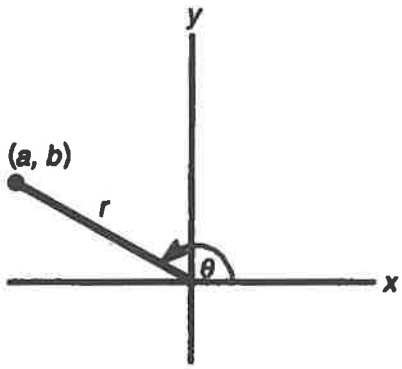
a) $0\vec{i}+0\vec{j}$ b) $\vec{i}-\vec{j}$ c) $\vec{i}+\vec{j}$

d) $\vec{v}=\frac{1}{3}\vec{i}-\frac{2}{3}\vec{j}$ e) $\frac{4}{5}\vec{i}+\frac{3}{5}\vec{j}$

---

3. In the figure $r\cos\theta$ equals

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

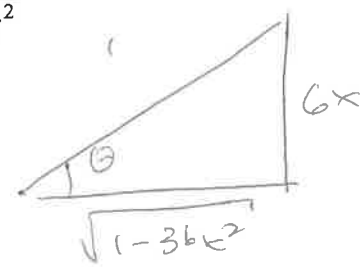


---

4. Simplify the expression $\tan\left(\sin^{-1} 6x\right)$.

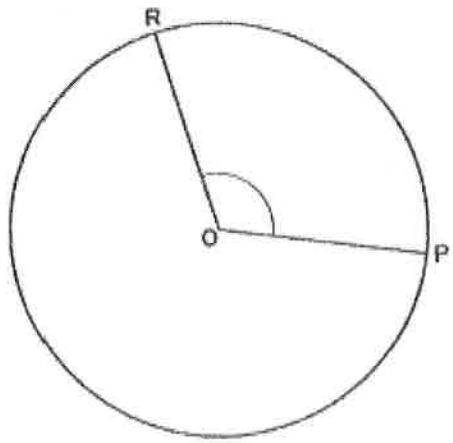
a) $\dfrac{6x}{\sqrt{1-6x^2}}$ b) $\dfrac{\sqrt{1-6x^2}}{6x}$ c) $\dfrac{6x}{\sqrt{1-36x^2}}$

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



TAN = $\frac{\text{OPP}}{\text{ADJ}}$

5. In the figure below, Circle O has radius π and $\widehat{PR}$ has length 4. What is the radian measure of $\angle POR$?



$\angle POR = \dfrac{\overline{PR}}{\text{RADIUS}} = \dfrac{4}{\pi}$

a) 1 b) 2 c) 4 d) $\dfrac{4}{\pi}$ e) $\dfrac{\pi}{4}$

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

$81+25 = 106$

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

---

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

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

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

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

Honors Precalculus '22-23 Name Solution Key

Trig Basics Test v1

Part II--CALCULATOR ALLOWED

1. $(12, -13)$ is on the terminal side of A. Find the six exact trig values:

$r = \sqrt{313}$

$\sin A = -13/\sqrt{313}$ $\csc A = -\sqrt{313}/13$

$\cos A = 12/\sqrt{313}$ $\sec A = \sqrt{313}/12$

$\tan A = -13/12$ $\cot A == -12/13$

2. If $\cos B = -5/8$ in QII, find the other five exact trig values:

$y = \sqrt{39}$

$\sin B = \sqrt{39}/8$ $\csc B = 8/\sqrt{39}$

$\cos B = -5/8$ $\sec B = -8/5$

$\tan B = -\sqrt{39}/5$ $\cot B = \neq -5/\sqrt{39}$

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

$A =$ $-47.271 \pm 360n$

$B =$ $128.682 \pm 360n$

4. (a) Find the approximate values of:

Cos -28= -.963

Sin -136°= -.695

Tan 2.34= -1.033

Sec -.717= 1.327

Csc 15.29°= 3.792

Cot 2 = -.458

(b) Find the approximate values (in degrees) of:

$\cos^{-1} 1.705 = \{$ NO SOLUTION

$\sin^{-1} (-0.516) = \{$ $-31.064° \pm 360°n$, $211.064° \pm 360°n$

$\tan^{-1} 0.758 = \{$ $37.162° \pm 180°n$

$\sec^{-1} 2.982 = \{$ $\pm 70.406° \pm 360°n$

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

6. A boat sails 48 mph at a bearing of 303°. The current flows 8 mph at 34°. Find the magnitude and bearing of the resultant vector.

$48\cos 303\,\vec{i} + 48\sin 303\,\vec{j}$

$8\cos 34\,\vec{i} + 8\sin 34\,\vec{j}$

$\vec{r} = 32.775\,\vec{i} - 35.783\,\vec{j}$

$|\vec{r}| = 48.524$ mph

$\theta = -\cos^{-1}\dfrac{32.775}{48.524} = -47.512$

7. If $\vec{s} = -12\vec{i} + 5\vec{j}$ and $\vec{r} = 5\vec{i} + 18\vec{j}$, find:

a. $5\vec{s} - 2\vec{r} = -60\vec{i} + 25\vec{j} - 10\vec{i} - 36\vec{j}$

$= -70\vec{i} - 11\vec{j}$

b. $|4\vec{s} + 7\vec{r}| = |-13\vec{i} + 146\vec{j}| = \sqrt{\cancel{21040}}\ \sqrt{21485}$

$4(-12\vec{i} + 5\vec{j}) + 7(5\vec{i} + 18\vec{j}) = -48\vec{i} + 20\vec{j} + 35\vec{i} + 126\vec{j}$

c. The unit vector in the direction $5\vec{s} - 2\vec{r}$

$\dfrac{-70}{\sqrt{5021}}\vec{i} - \dfrac{2}{\sqrt{5021}}\vec{j}$