Name **Schlansky**
Mr. Schlansky
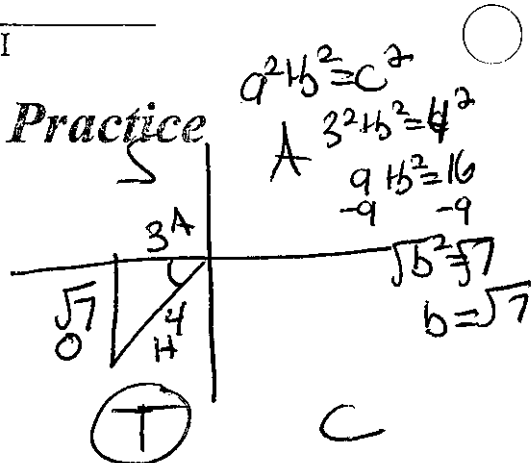Date _____
Algebra II

Advanced Trig Ratios Regents Practice

$a^2+b^2=c^2$
$3^2+b^2=4^2$
$9+b^2=16$
$-9 \quad -9$
$\sqrt{b^2}=\sqrt{7}$
$b=\sqrt{7}$

1. If $\cos\theta=-\frac{3}{4}$ and θ is in Quadrant III, then $\sin\theta$ is equivalent to
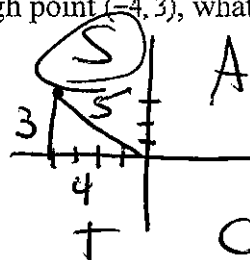
$\frac{A}{H}$

1) $-\frac{\sqrt{7}}{4}$ 3) $-\frac{5}{4}$ $\sin\theta=\frac{O}{H}$

2) $\frac{\sqrt{7}}{4}$ 4) $\frac{5}{4}$ $\sin\theta=-\frac{\sqrt{7}}{4}$

2. If the terminal side of angle θ, in standard position, passes through point $(-4,3)$, what is the numerical value of $\sin\theta$?
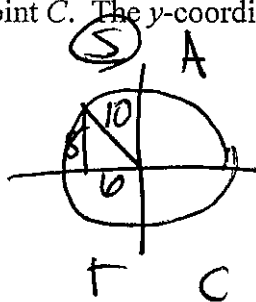
1) $\frac{3}{5}$ 3) $-\frac{3}{5}$ $\sin\theta=\frac{O}{H}$

2) $\frac{4}{5}$ 4) $-\frac{4}{5}$ $\sin\theta=\frac{3}{5}$

3 A circle centered at the origin has a radius of 10 units. The terminal side of an angle, θ, intercepts the circle in Quadrant II at point C. The y-coordinate of point C is 8. What is the value of $\cos\theta$?
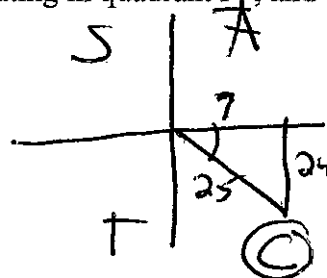
1) $-\frac{3}{5}$ 3) $\frac{3}{5}$ $\cos\theta=\frac{A}{H}$

2) $-\frac{3}{4}$ 4) $\frac{4}{5}$ $\cos\theta=\frac{6}{10}$

$\cos\theta=-\frac{3}{5}$

$a^2+b^2=c^2$
$a^2+8^2=10^2$
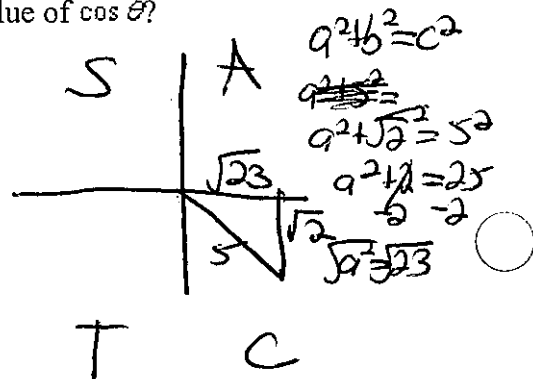$a^2+64=100$
$-64 \quad -64$
$\sqrt{a^2}=\sqrt{36}$
$a=6$

4. Given $\cos\theta=\frac{7}{25}$, where θ is an angle in standard position terminating in quadrant IV, and $\sin^2\theta+\cos^2\theta=1$, what is the value of $\tan\theta$?

$\frac{A}{H}$ $\tan\theta=\frac{O}{A}$

1) $-\frac{24}{25}$ 3) $\frac{24}{25}$ $\tan\theta=\frac{-24}{7}$

2) $-\frac{24}{7}$ 4) $\frac{24}{7}$

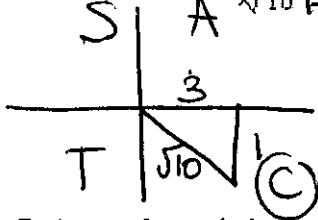5. Given that $\sin^2\theta+\cos^2\theta=1$ and $\sin\theta=-\frac{\sqrt{2}}{5}$, what is a possible value of $\cos\theta$?

$\frac{O}{H}$ $\sqrt{2}\Rightarrow$ Could be III or IV

1) $\frac{5+\sqrt{2}}{5}$ 3) $\frac{3\sqrt{3}}{5}$ $\cos\theta=\frac{A}{H}$

2) $\frac{\sqrt{23}}{5}$ 4) $\frac{\sqrt{35}}{5}$ $\cos\theta=\frac{\sqrt{23}}{5}$

$a^2+b^2=c^2$
$a^2+\sqrt{2}^2=5^2$
$a^2+2=25$
$a^2=23$
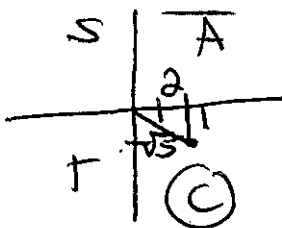$\sqrt{a^2}=\sqrt{23}$

$\cos +$ $\tan -$

6. Given $\cos A = \dfrac{3}{\sqrt{10}}$ and $\cot A = -3$, determine the value of $\sin A$ in radical form.

$\tan A = -\dfrac{1}{3}$

$\sin A = \dfrac{O}{H}$

$\sin A = \dfrac{1}{\sqrt{10}} \cdot \dfrac{\sqrt{10}}{\sqrt{10}} = \boxed{-\dfrac{\sqrt{10}}{10}}$

7. An angle, θ, is in standard position and its terminal side passes through the point $(2,-1)$. Find the *exact* value of $\sin \theta$.

$a^2 + b^2 = c^2$

$2^2 + 1^2 = c^2$

$4 + 1 = c^2$

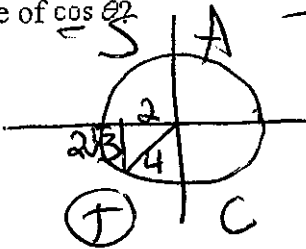$\sqrt{5} = \sqrt{c^2}$

$\sqrt{5} = c$

$\sin \theta = \dfrac{O}{H}$

$\sin \theta = \dfrac{1}{\sqrt{5}} \cdot \dfrac{\sqrt{5}}{\sqrt{5}} = \boxed{-\dfrac{\sqrt{5}}{5}}$

8. A circle centered at the origin has a radius of 4 units. The terminal side of an angle, θ, intercepts the circle in Quadrant III at point P. The x-coordinate of point P is 2. What is the value of $\cos \theta$?

$a^2 + b^2 = c^2$ $\sqrt{b^2} = \sqrt{12}$

$2^2 + b^2 = 4^2$ $b = \sqrt{4}\sqrt{3}$

$4 + b^2 = 16$ $b = 2\sqrt{3}$

$-4 \quad -4$

$\cos \theta = \dfrac{A}{H}$

$\cos \theta = \dfrac{2}{4}$

$\boxed{\cos \theta = -\dfrac{1}{2}}$

9. The terminal side of θ, an angle in standard position, intersects the unit circle at $P\left(-\dfrac{1}{3}, \dfrac{\sqrt{8}}{3}\right)$

$\dfrac{A}{H} \quad \dfrac{O}{H}$

$\cos \theta, \sin \theta$

What is the value of $\sec \theta$?

1) -3 3) $-\dfrac{1}{3}$

2) $-\dfrac{3\sqrt{8}}{8}$ 4) $-\dfrac{\sqrt{8}}{3}$

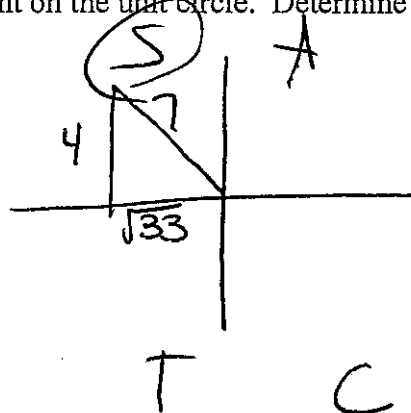If $\cos \theta = -\dfrac{1}{3}$

$\sec \theta = -3$

10. Point $M\left(t, \dfrac{4}{7}\right)$ is located in the second quadrant on the unit circle. Determine the exact value of t.

$\cos \theta, \sin \theta$

$\sin \theta = \dfrac{4}{7} \quad \dfrac{O}{H}$

It is asking for $\cos \theta$.

$\cos \theta = \dfrac{A}{4}$

$\boxed{\cos \theta = -\dfrac{\sqrt{33}}{7}}$

$a^2 + b^2 = c^2$

$a^2 + 4^2 = 7^2$

$a^2 + 16 = 49$

$-16 \quad -16$

$\sqrt{a^2} = \sqrt{33}$