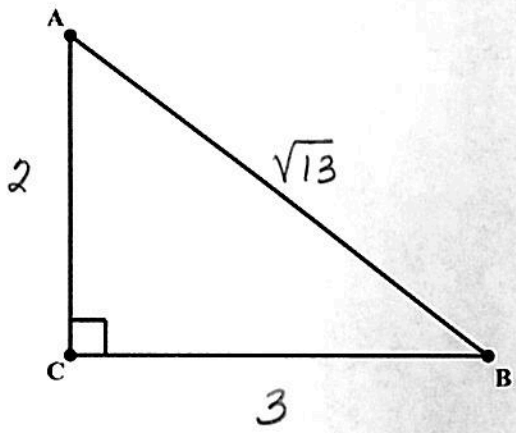
Name: Key Date:

Unit 6: Review – Trigonometric Functions

1. Fill in the denominator with $\sin\theta, \cos\theta$ or $\tan\theta$

a) $\csc\theta = \frac{1}{\sin\theta}$ b) $\sec\theta = \frac{1}{\cos\theta}$ c) $\cot\theta = \frac{1}{\tan\theta}$ or $\frac{\cos\theta}{\sin\theta}$

2. In the diagram shown, ΔABC is a right triangle with $m\angle C = 90°$, AC = 2 and BC = 3. Find the value of:



a) $\boxed{AB = \sqrt{13}}$

$2^2 + 3^2 = c^2$

$13 = c^2$

$c = \sqrt{13}$

b) $\sin B = \boxed{\frac{2}{\sqrt{13}}}$ e) $\cos B = \boxed{\frac{3}{\sqrt{13}}}$

c) $\tan B = \boxed{\frac{2}{3}}$ f) $\csc B = \boxed{\frac{\sqrt{13}}{2}}$

d) $\sec B = \boxed{\frac{\sqrt{13}}{3}}$ g) $\cot B = \boxed{\frac{3}{2}}$

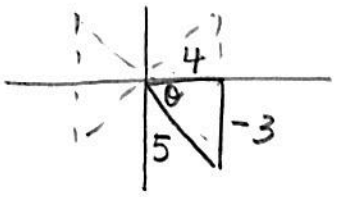
3. If the coordinates of Point P on the unit circle are $\left(\overset{C}{\frac{\sqrt{3}}{2}}, \overset{S}{\frac{1}{2}}\right)$, find:

a. $\sin\theta = \boxed{\frac{1}{2}}$

b. $\cos\theta = \boxed{\frac{\sqrt{3}}{2}}$

c. $\tan\theta$ $\frac{\sin\theta}{\cos\theta} = \frac{\frac{1}{2}}{\frac{\sqrt{3}}{2}} \rightarrow \frac{1}{2} \cdot \frac{2}{\sqrt{3}} \rightarrow \boxed{\frac{1}{\sqrt{3}}}$

4. If the $\sin\theta = -\frac{3}{5}$ and $\cos\theta > 0$, what is the value of $\tan\theta$?



$(-3)^2 + (x)^2 = (5)^2$

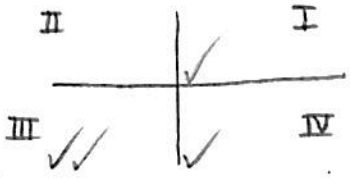
$9 + x^2 = 25$

$x^2 = 16$

$x = \pm 4$ $x = 4$ only

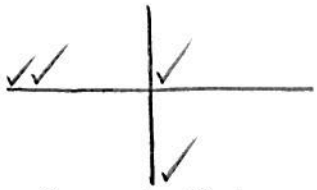
$\tan\theta = \frac{-3}{4}$

5. If $\sin\theta < 0$ and $\tan\theta > 0$, which quadrant does θ lie in?



III

6. If $\cot\theta < 0$ and $\csc\theta > 0$, which quadrant does θ lie in?



II

7. An angle, P, drawn in standard position, terminates in Quadrant II if

A. $\cos P < 0$ and $\csc P < 0$

B. $\sin P > 0$ and $\cot P > 0$

C. $\csc P > 0$ and $\cot P < 0$

D. $\tan P < 0$ and $\sec P > 0$

8. If $\cos x = \frac{1}{a}, a \neq 0,$, which statement must be true?

A. $\csc x = a$

C. $\csc x = -\frac{1}{a}$

B. $\sec x = a$

D. $\sec x = -\frac{1}{a}$

* Secx and Cosx are reciprocal functions.

9. If $\csc\theta = -2$, what is the value of $\sin\theta$?

A. -2

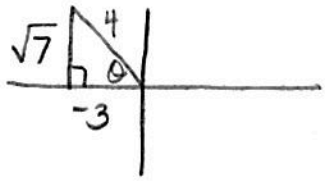
B. 2

C. $-\frac{1}{2}$

D. $\frac{1}{2}$

Cscθ & Sinθ are reciprocal functions

10. If $\cos B = \frac{-3}{4}$, and B is in Quadrant II, find:



a) $\sin\theta =$ $\frac{\sqrt{7}}{4}$

c) $\csc\theta =$ $\frac{4}{\sqrt{7}}$

b) $\tan\theta =$ $\frac{-\sqrt{7}}{3}$

d) $\cot\theta =$ $\frac{-3}{\sqrt{7}}$

e) $\sec\theta =$ $\frac{\sqrt{7}}{4}$

$(-3)^2 + x^2 = (4)^2$

$9 + x^2 = 16$

$x^2 = 7$

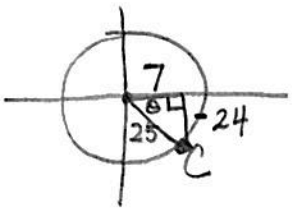
$x = \pm\sqrt{7}$

only $x = \sqrt{7}$

11. A circle centered at the origin has a radius of 25 units. The terminal side of an angle, θ, intercepts the circle in Quadrant IV at point C. The y-coordinate of point C is -24. Draw a diagram and find the values of all 6 trig functions:

a) $\sin\theta =$ $\frac{-24}{25}$

d) $\csc\theta =$ $\frac{-25}{24}$



b) $\cos\theta =$ $\frac{7}{25}$

e) $\sec\theta =$ $\frac{25}{7}$

c) $\tan\theta =$ $\frac{-24}{7}$

f) $\cot\theta =$ $\frac{-7}{24}$

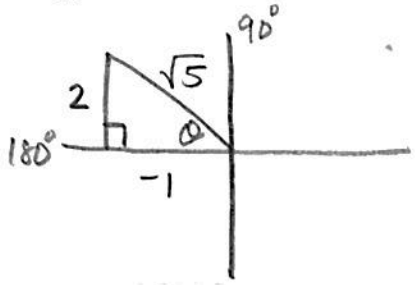
$x^2 + (-24)^2 = (25)^2$

$x^2 + 576 = 625$

$x^2 = 49$

$x = \pm 7$ only $x = 7$

12. Suppose $90^\circ < \theta < 180^\circ$ and $\sec\theta = -\sqrt{5}$. What is the value of $\sin(\theta^\circ)$?



$\cos\theta = \frac{-1}{\sqrt{5}}$

$\sin\theta = \frac{2}{\sqrt{5}}$

$(-1)^2 + y^2 = (\sqrt{5})^2$

$1 + y^2 = 5$

$y^2 = 4$ $y = \pm 2$ only $y = 2$

13. Express 160° in radians and express in terms of π. *(Reduce to lowest terms)*

$160^\circ \cdot \frac{\pi}{180^\circ} \rightarrow \frac{160\pi}{180}$ $\frac{8\pi}{9}$

14. What is the number of degrees in an angle whose radian measure is $\frac{11\pi}{12}$?

1) 150° 3) 165°

2) 330° 4) 518°

$\frac{11\pi}{12} \cdot \frac{180^\circ}{\pi} = \frac{1980}{12}$ 165°

15. What is the radian measure of the smaller angle formed by the hands of a clock at 3:00 p.m.?

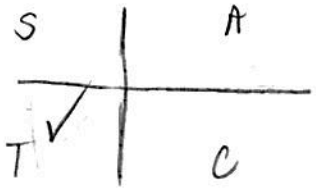
A. $\frac{\pi}{2}$ B. $\frac{\pi}{4}$ C. $\frac{\pi}{3}$ D. $\frac{\pi}{6}$

$\frac{1}{90^\circ} \cdot \frac{\pi}{180^\circ} \quad \frac{1}{2}$

16. 5.4 radians equals how many degrees to the nearest tenth?

$\left(\frac{5.4}{1}\right)\left(\frac{180^\circ}{\pi}\right)$ $\frac{972^\circ}{\pi}$ 309.4°

17. If $\cos\theta = -.4$, and θ in in quadrant III, find the value of $\tan\theta$ using the identity $\sin^2\theta + \cos^2\theta = 1$.



$\sin^2\theta + (-.4)^2 = 1$

$\sin^2\theta + .16 = 1$

$\sin^2\theta = .84$

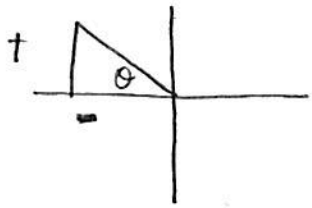
$\sqrt{\sin^2\theta} = \sqrt{\frac{21}{25}}$

$\Rightarrow \sin\theta = \pm\frac{\sqrt{21}}{5}$

Keep $\sin\theta = -\frac{\sqrt{21}}{5}$ (Quad III)

$\tan\theta = \frac{\sin\theta}{\cos\theta} = \frac{-\frac{\sqrt{21}}{5}}{-\frac{2}{5}} = \boxed{+\frac{\sqrt{21}}{2}}$

18. If $\sin\theta = .6$, and θ in in quadrant II, find the value of $\cos\theta$ using the identity $\sin^2\theta + \cos^2\theta = 1$.



$(.6)^2 + \cos^2\theta = 1$

$.36 + \cos^2\theta = 1$

$\sqrt{\cos^2\theta} = \sqrt{.64}$

$\cos\theta = \pm .8$

* Keep $\cos\theta = -.8$ * ($\cos\theta$ is negative in Quad. II)

$\boxed{\cos\theta = -.8}$

19. What is the remainder when $x^3 - 4x^2 + 3x - 4$ is divided by $x - 3$? Is $x - 3$ a factor?

$(3)^3 - 4(3)^2 + 3(3) - 4$

$27 - 36 + 9 - 4$

-4

Remainder is -4

NO, $x-3$ isn't a factor since the Remainder $\neq 0$

20. If x – 1 is a factor of $x^{42} + 2k + 7$, what does k equal?

$(1)^{42} + 2K + 7 = 0$

$1 + 2K + 7 = 0$

$2K + 8 = 0$

$K = -4$

21. Factor $9x^4 - 100y^{10}$

DOTS

$(3x^2 + 10y^5)(3x^2 - 10y^5)$

22. Simplify $\dfrac{6-8x}{12x^2 - x - 6}$

$12x^2 - x - 6$

$12x^2 - 9x + 8x - 6$ $\quad -72x^2$, $-9x$, $8x$

$3x(4x-3) + 2(4x-3)$

$(4x-3)(3x+2)$

$\dfrac{2(3-4x)}{(4x-3)(3x+2)}$ $\quad -1$

$\dfrac{-2}{3x+2}$

23. Factor $x^4 + 10x^2 + 21$

$x^4 + 7x^2 + 3x^2 + 21$ $\quad 21x^4$, $7x^2$, $3x^2$

$x^2(x^2+7) + 3(x^2+7)$

$(x^2+7)(x^2+3)$

24. Solve for x to the nearest hundredth: $4x^2 - 9 = 0$

DOTS

$(2x-3)(2x+3) = 0$

$2x - 3 = 0$ $\quad$ $2x + 3 = 0$

$x = \frac{3}{2}$ $\quad$ $x = -\frac{3}{2}$

$x = \pm \frac{3}{2}$