Name Answer key

Date _____

Ms. Schmidt

Pre-Calculus

Final Review #3

1) $4\cos^2\theta - 1 = 0$ $[0, 2\pi)$

Let $\cos\theta = x$

$4x^2 - 1 = 0$

$4x^2 = 1$

$\sqrt{x^2} = \sqrt{\frac{1}{4}}$

$x = \pm\frac{1}{2}$

$\cos\theta = \pm\frac{1}{2}$

Ref $\angle$ $60°$

$\frac{2\pi}{3}$	$\pi/3$
$\frac{4\pi}{3}$	$\frac{5\pi}{3}$

$\theta = \pi/3$ $\theta = 2\pi/3$

$\theta = 4\pi/3$ $\theta = 5\pi/3$

2) $2\sin^2\theta - 1 = 0$ $[0, 2\pi)$

Let $x = \sin\theta$

$2x^2 - 1 = 0$

$2x^2 = 1$

$\sqrt{x^2} = \sqrt{\frac{1}{2}}$

$x = \pm\frac{1}{\sqrt{2}}$

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

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

Ref $\angle = 45$

$\frac{3\pi}{4}$	$\pi/4$
$\frac{5\pi}{4}$	$\frac{7\pi}{4}$

$\theta = \pi/4$ $\theta = 3\pi/4$

$\theta = 5\pi/4$ $\theta = 7\pi/4$

3) $\cot x + 1 = \csc x(\cos x + \sin x)$

$\cot x + 1 = \frac{1}{\sin x}(\cos x + \sin x)$

$\cot x + 1 = \frac{\cos x}{\sin x} + \frac{\sin x}{\sin x}$

$\cot x + 1 = \cot x + 1$

✓

4) $\sin 240$

Ref $\angle$: $240 - 180 = 60$

S A

T C

III

quadrant

Q III

R = 60

Sign −

$-\sin 60 = -\frac{\sqrt{3}}{2}$

5)

$\sec(-750)$

R: $-750 + 360 + 360 + 360$

$330°$

-300

$\text{ref } 30°$

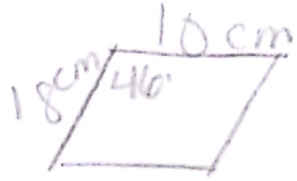
Q: IV

S: +

S	A
T	C

$\sec 30° = \frac{2}{\sqrt{3}}$

6)



$A_\triangle = \frac{1}{2}ab\sin C$

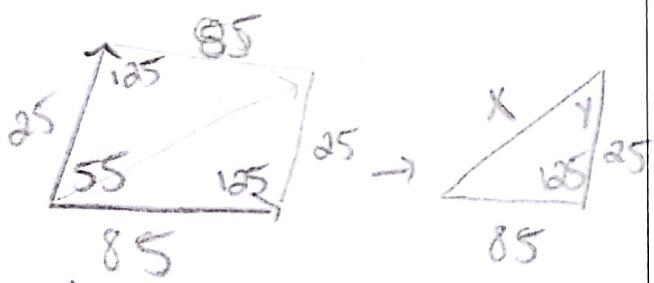
$A_\square = ab\sin C$

$= (18)(10)\sin 46$

≈ 129.48

$129\ cm^2$

7)



a) $c^2 = a^2 + b^2 - 2ab\sin C$

$c^2 = 85^2 + 25^2 - 2(85)(25)\cos 125$

$c^2 = 10287.69985$

$c = 101.43$ newtons

b) $\frac{101.43}{\sin 125} = \frac{85}{\sin Y} \rightarrow \frac{101.43 \sin Y}{101.43} = \frac{85 \sin 125}{101.43}$

$\sin Y = .686476$

$Y = 43°$

8)

(0,6) (5,1) (2,-2)

Points! Always 1

$\begin{bmatrix} 0 & 6 & 1 \\ 5 & 1 & 1 \\ 2 & -2 & 1 \end{bmatrix}$

Calc!

$A = \pm\frac{1}{2}\det\begin{bmatrix} 0 & 6 & 1 \\ 5 & 1 & 1 \\ 2 & -2 & 1 \end{bmatrix}$

$A = \pm\frac{1}{2}(-30)$

$A = 15$

9)

$$h(x) = \begin{cases} 4x+1 & x<3 \\ x^2+bx & x \geq 3 \end{cases}$$

at $x=3$

$$\lim_{x\to 3^-} 4x+1 = \lim_{x\to 3^+} x^2+bx$$

$$4(3)+1 = (3)^2+b(3)$$

$$12+1 = 9+3b$$

$$13 = 9+3b$$

$$-9 \quad -9$$

$$\frac{4}{3} = \frac{3b}{3}$$

$$\boxed{\frac{4}{3} = b}$$

10)

$$\frac{10x-35}{x^2-5x} = \frac{A}{x} + \frac{B}{x-5}$$

$$10x-35 = A(x-5)+Bx$$

$$10x-35 = Ax-5A+Bx$$

$$10x = Ax+Bx$$

$$\frac{-35}{-5} = \frac{-5A}{-5}$$

$$7 = A$$

$$10 = A+B$$

$$10 = 7+B$$

$$-7 \quad -7$$

$$3 = B$$

$$\boxed{\frac{7}{x} + \frac{3}{x-5}}$$

11)

$$x-2y+z=-1$$
$$2x+3y-2z=-3$$
$$x+3y-2z=-2$$

$$x-2y+z=-1$$
$$-(x+3y-2z=-2)$$

$$-5y+3z=1$$

$$-2(x-2y+z=-1)$$
$$2x+3y-2z=-3$$

$$-2x+4y-2z=2$$
$$2x+3y-2z=-3$$
$$7y-4z=-1$$

$$7(-5y+3z=1)$$
$$5(7y-4z=-1)$$

$$-35y+21z=7$$
$$35y-20z=-5$$
$$z=2$$

$$-5y+3(2)=1$$
$$-5y+6=1$$
$$-6\ -6$$
$$-5y=-5$$
$$y=1$$

$$x-2(1)+2=-1$$
$$x-2+2=-1$$
$$x=-1$$

$(-1,1,2)$

12)

$$f(x)=\begin{cases} x^2+6x+7 & x\geq 3 \\ 2x+4 & x<3 \end{cases}$$

$f(3)=3^2+6(3)+7=34$ ✓

$\lim_{x\to 3^-} x^2+6x+7=34$

$\lim_{x\to 3^+} 2x+4=2(3)+4=10$

$\lim_{x\to 3} f(x)=DNE$ X

Not continuous. ✓