AFM UNIT 3B MIDTERM REVIEW Name key 2017

**Find a positive and a negative coterminal angle for each given angle.** *add/subtract 360° or 2π*

1) 372°
pos: 732°, 12°
neg: −348°

2) −150°
pos: 210°
neg: −510°

3) $\frac{13\pi}{36}$
pos: $\frac{85\pi}{36}$
neg: $-\frac{59\pi}{36}$

4) $-\frac{65\pi}{36}$
pos: $\frac{7\pi}{36}$
neg: $-\frac{137\pi}{36}$

**Convert each degree measure into radians and each radian measure into degrees.**

5) $420° \cdot \frac{\pi}{180}$ → $\frac{7\pi}{3}$

6) $660°$ → $\frac{11\pi}{3}$

7) $\frac{41\pi}{12} \cdot \frac{180}{\pi}$ → 615°

8) $\frac{65\pi}{12}$ → 975°

**Find the exact value of each trigonometric function.** *you can use your calc! just make sure you're in the right mode!

9) $\sin\frac{5\pi}{6}$ *radian mode! → $\frac{1}{2}$

10) cot 240° *degree mode
find tan first, then $\cot\theta = \frac{1}{\tan\theta}$
$\tan 240 = 1.7321$ same as $\sqrt{3}$ so $\cot\theta = \frac{1}{\sqrt{3}}$
So $\cot 240 = \frac{\sqrt{3}}{3}$

11) cot 60° → $\frac{\sqrt{3}}{3}$
find tan60° first

12) csc 240°
find sin240 first!
$\sin 240° = -\frac{\sqrt{3}}{2}$
So $\csc\theta = \frac{1}{-\sqrt{3}/2}$
$\csc 240 = -\frac{2\sqrt{3}}{3}$

13) $\cot -\frac{11\pi}{4}$ *radian mode
$\tan^{-1}\frac{11\pi}{4} = 1$
$\cot = \frac{1}{1}$
$\cot -\frac{11\pi}{4} = 1$

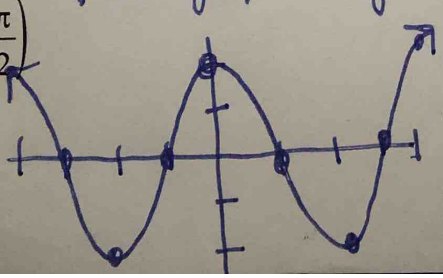
14) $\csc\frac{7\pi}{4}$
find $\sin\frac{7\pi}{4}$ first!
$\sin\frac{7\pi}{4} = -\frac{\sqrt{2}}{2}$
$\csc\frac{7\pi}{4} = \frac{1}{-\sqrt{2}/2}$
→ $-\sqrt{2}$

15) $\cos -\frac{23\pi}{4}$
.7071 → $\frac{\sqrt{2}}{2}$

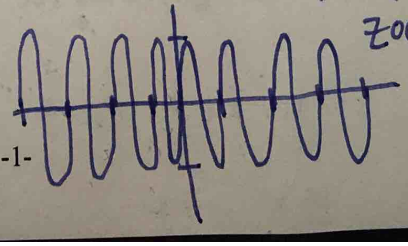
16) $\sec\frac{13\pi}{4}$
find cos first!
$\cos\frac{13\pi}{4} = -.7071 = -\frac{\sqrt{2}}{2}$
$\sec\frac{13\pi}{4} = \frac{1}{-\sqrt{2}/2}$
→ $-\sqrt{2}$

**Graph each function using radians.** *can graph in your calculator! make sure your calc. is in RADIAN MODE, then use ZOOM TRIG and change your window:
XMIN = −2π
XMAX = 2π
XSCL = π/2

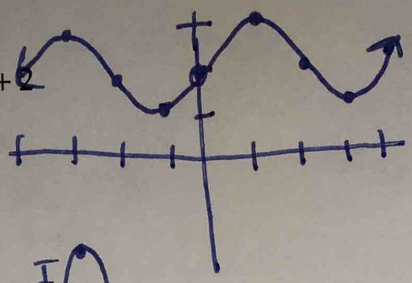
17) $y = 2\sin\left(\theta + \frac{\pi}{2}\right)$ plug in "x" for θ



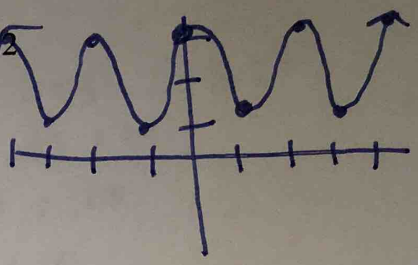
18) $y = \sin 4\theta$



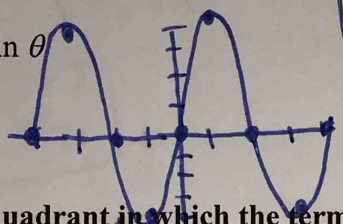
19) $y = \cos\left(\theta - \frac{\pi}{2}\right) + 2$



20) $y = \cos 2\theta + 2$



21) $y = 4\sin\theta$



**State the quadrant in which the terminal side of each angle lies.**

22) $-\frac{\pi}{3} + 2\pi = 5\pi/3$

IV

23) $-418° + 360 + 360 = 302°$

IV

24) $-10° + 360 = 350°$

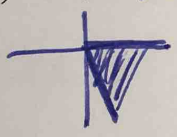
IV

25) $\frac{\pi}{4}$

I

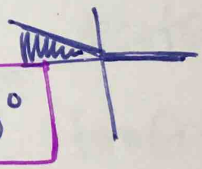
**Find the reference angle.** ★ angle made w/ terminal side & x-axis: • always acute • always positive

26) $-430° + 360 + 360 = 290°$



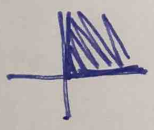
70°

27) 140°



40°

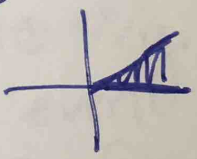
28) $445° - 360 = 85°$



85°

29) $-340° + 360 = 20°$

20°



**Use the given point on the terminal side of angle $\theta$ to find the value of the trigonometric function indicated.**

30) $\cos\theta; \left(6, -\sqrt{13}\right)$

31) $\sin\theta; \left(-9, -\sqrt{19}\right)$

★ see other sheet ★

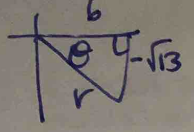
32) $\cos\theta; (-6, 18)$

33) $\cos\theta; (3, 4)$

34) $\sec\theta; (4, -2)$

35) $\cot\theta; (13, -10)$

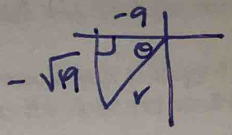
(30) find $\cos\theta$ $(6, -\sqrt{13})$




$r^2 = 6^2 + (-\sqrt{13})^2$
$r^2 = 36 + 13$
$r^2 = 49$
$r = 7$

$\cos\theta = 6/7$

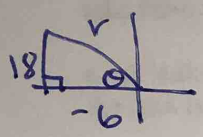
(31) $\sin\theta$ $(-9, -\sqrt{19})$




$r^2 = (-9)^2 + (-\sqrt{19})^2$
$r^2 = 81 + 19$
$r^2 = 100$
$r = 10$

$\sin\theta = -\frac{\sqrt{19}}{10}$

(32) $\cos\theta$ $(-6, 18)$

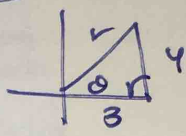



$r^2 = (-6)^2 + (18)^2$
$r^2 = 36 + 324$
$r^2 = 360$
$r = \sqrt{360}$
$r = 6\sqrt{10}$

$\cos\theta = \frac{-6}{6\sqrt{10}}$ *reduce then rationalize!

$\cos\theta = \frac{-1}{\sqrt{10}} \cdot \frac{\sqrt{10}}{\sqrt{10}}$ $\cos\theta = -\frac{\sqrt{10}}{10}$

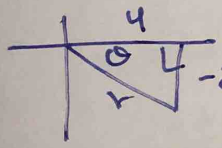
(33) $\cos\theta$ $(3, 4)$




$r^2 = 3^2 + 4^2$
$r^2 = 9 + 16$
$r^2 = 25$ $r = 5$

$\cos\theta = 3/5$

(34) $\sec\theta$ $(4, -2)$




$r^2 = 4^2 + (-2)^2$
$r^2 = 16 + 4$
$r^2 = 20$
$r = \sqrt{20}$
$r = 2\sqrt{5}$

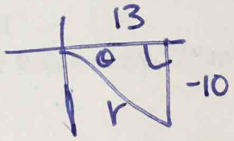
$\sec\theta$ goes w/ $\cos$....

$\cos = x/r$ so $\sec = r/x$

$\sec\theta = \frac{2\sqrt{5}}{4}$ *reduce!

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

(35) $\cot\theta$ $(13, -10)$




*$\cot\theta$ goes w/ $\tan\theta$...

$\tan\theta = y/x$ so

$\cot\theta = x/y$ ... we don't even need to solve for r!

$\cot\theta = -13/10$