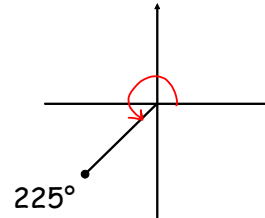


# Sample Test 3

## Spring 2019

May 4-11:32 AM

01. Estimate the number of degrees in the angle.



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02. State the quadrant where each angle lies:

a)  $\theta = 295^\circ$     Q4

b)  $\theta = -145^\circ$     Q3

c)  $\theta = \frac{13\pi}{2}$     Does not lie in any quadrant

d)  $\theta = \frac{5\pi}{4}$     Q3

e)  $\theta = 2$     Q2

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03.

a) Convert the angle to degrees

$$\frac{7\pi}{3} \cdot \left(\frac{180^\circ}{\pi}\right) = 420^\circ$$

b) Convert the angle to radians, keeping  $\pi$

$$315^\circ \cdot \left(\frac{\pi}{180^\circ}\right) = \frac{7\pi}{4}$$

04. Convert the angle to decimal degrees.

$$235^{\circ}32'35'' = 235.543^{\circ}$$

$$235 \boxed{\text{D}^{\circ}\text{M}'\text{S}''} 32 \boxed{\text{D}^{\circ}\text{M}'\text{S}''} 35 = \textcircled{2\text{nd F}} \boxed{\text{D}^{\circ}\text{M}'\text{S}''}$$

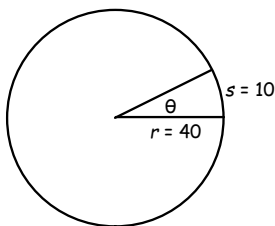
05. Convert the angle to  $\text{D}^{\circ}\text{M}'\text{S}''$ .

$$36.2575^{\circ} = 36^{\circ}15'27''$$

$$36.2575 \textcircled{2\text{nd F}} \boxed{\text{D}^{\circ}\text{M}'\text{S}''} =$$

06. An angle  $\theta$  cuts an arc length of 10 from a circle of radius 40.

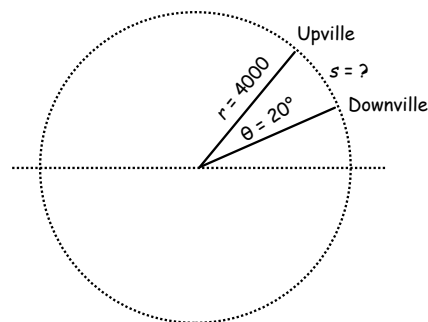
a) Draw a picture.



b) What is the radian measure of  $\theta$ ?

$$\theta = \frac{s}{r} = \frac{10}{40} = \frac{1}{4}$$

07. Uprville is  $50^{\circ}\text{N}$  and Downville is  $30^{\circ}\text{N}$ .



$$s = r \cdot \theta = 4000 \cdot 20^{\circ} \cdot \left(\frac{\pi}{180^{\circ}}\right) \approx 1396 \text{ mile}$$

08. Sketch the angle in standard position. Use an arrow to indicate the amount and direction of rotation.

$$\frac{5\pi}{3} = \frac{6\pi}{3} - \frac{\pi}{3}$$

$$\frac{5\pi}{3} = 2\pi - \frac{\pi}{3}$$

one rotation

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09. Sketch the angle in standard position. Use an arrow to indicate the amount and direction of rotation.

$$\frac{7\pi}{4} = \frac{8\pi}{4} - \frac{\pi}{4}$$

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10. One leg of a right triangle has length 8 and the hypotenuse has length 12. Let  $\theta$  be the angle opposite the leg of length 8. Find the  $\tan(\theta)$ .

**SOH CAH TOA**

Tan = opp/adj

$x =$

$$8^2 + x^2 = 12^2$$

$$x^2 = 12^2 - 8^2$$

$$x = \sqrt{80}$$

$$\tan(\theta) = \frac{8}{\sqrt{80}}$$

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11. A right triangle contains an angle of  $25^\circ$ . The side opposite the angle of  $25^\circ$  has length 10. How long is the hypotenuse?

**SOH CAH TOA**

$x =$

$$\sin(25^\circ) = \frac{10}{x}$$

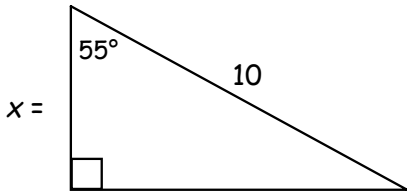
$$x = \frac{10}{\sin(25^\circ)} \approx 23.66$$

Make sure the calculator is in DEG mode!!!

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12. A right triangle contains an angle of  $55^\circ$ . The hypotenuse has length 10. How long is the side adjacent the angle of  $55^\circ$  ?

SOH CAH TOA



$\cos(55^\circ) = \frac{x}{10}$  Make sure the calculator is in DEG mode!!!

$10\cos(55^\circ) = x \approx 5.736$

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13. Find the trig ratios using a calculator.

$\sin(135^\circ) = .707$        $\csc(135^\circ) = 1.414$

$\cos(214^\circ) = -.829$        $\sec(214^\circ) = -1.206$

$\tan(735^\circ) = .268$        $\cot(735^\circ) = 3.732$

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14. The point  $(-6,12)$  lies on the terminal ray of an angle  $\theta$ .

a) The distance to Origin

$r = \sqrt{x^2 + y^2}$

$r = \sqrt{(-6)^2 + (12)^2}$

$r = \sqrt{180}$

syr cxr tyx

$\sin(\theta) = \frac{y}{r} = \frac{12}{\sqrt{180}}$

$\csc(\theta) = \frac{r}{y} = \frac{\sqrt{180}}{12}$

$\cos(\theta) = \frac{x}{r} = \frac{-6}{\sqrt{180}}$

$\sec(\theta) = \frac{r}{x} = \frac{\sqrt{180}}{-6}$

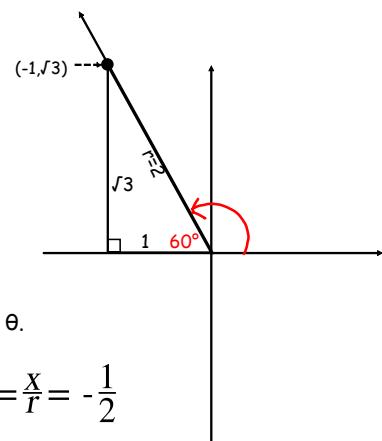
$\tan(\theta) = \frac{y}{x} = -2$

$\cot(\theta) = \frac{x}{y} = -\frac{1}{2}$

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15. Suppose  $\theta = 120^\circ$ .

a) Let  $\theta'$  be the reference angle  $\theta$ . Then  $\theta' = 60^\circ$



So  $(-1, \sqrt{3})$  lies on  $\theta$ .

$\cos(120^\circ) = \frac{x}{r} = -\frac{1}{2}$

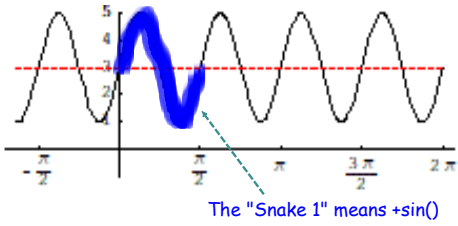
c)  $120^\circ + 360^\circ = 480^\circ$ .

d)  $120^\circ - 360^\circ = -240^\circ$ .

Add or subtract 360 until you get the correctly signed answer.

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16. Find the formula.



M:  $y = 3$

A: 2  $y = 2\sin(4x) + 3$

P:  $\pi/2$

$$b = \frac{2\pi}{P} = \frac{2\pi}{\frac{\pi}{2}} = 2\pi \cdot \left(\frac{2}{\pi}\right) = 4$$

17. Max = 10; Min = 6;  $f(9) = 10$ ; Period = 18

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The end.