

# Quiz 4

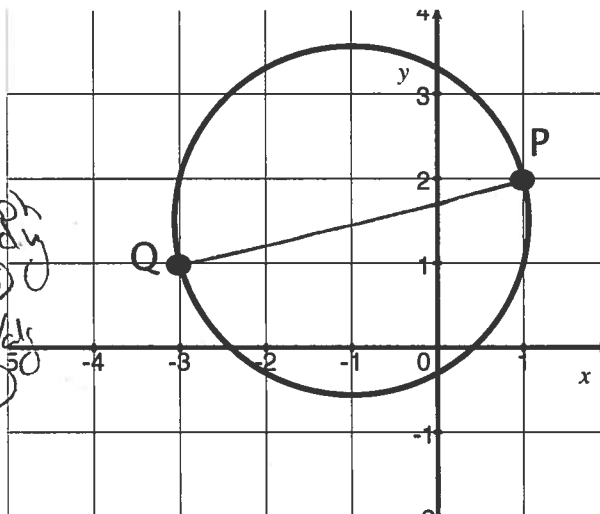
Key

Show *all* your work. No credit is given without reasonable supporting work. There are *two* sides to this quiz.

1. The line connecting point  $P$  and  $Q$  is a diameter of the circle shown.

(a) [1] (WebHW10 #1) Find the distance from  $P$  to  $Q$ .

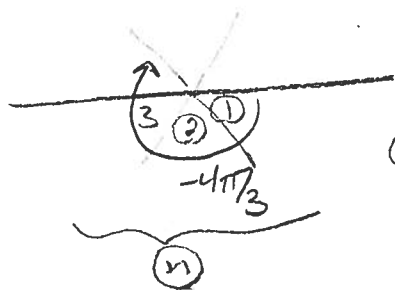
$P = (1, 2)$      $Q = (-3, 1)$  } *rough ready*  
 $\text{dist}^2 = (x_2 - x_1)^2 + (y_2 - y_1)^2$  } *works*  
 $\text{dist}^2 = 4^2 + 1^2$  } *15*  
 $\Rightarrow \text{distance} = \sqrt{17}$



(b) [2] (WebHW1- #6) Write an equation for the circle.

- ①.5 { Center is the midpoint between  $P$  and  $Q$  so  $(\frac{1-3}{2}, \frac{2+1}{2}) = (-1, 1.5)$
- ①.5 { radius is  $\frac{\sqrt{17}}{2}$
- ①.5 { recall a circle centred at  $(h, k)$  with radius  $r$  can be written as  $(x-h)^2 + (y-k)^2 = r^2$
- ①.5 { So  $(x-(-1))^2 + (y-1.5)^2 = (\frac{\sqrt{17}}{2})^2$  or  $(x+1)^2 + (y-1.5)^2 = \frac{17}{4}$

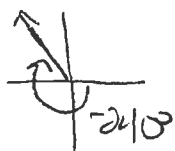
2. [2] (§4.1 #13) Draw the angle  $-\frac{4\pi}{3}$  radians.



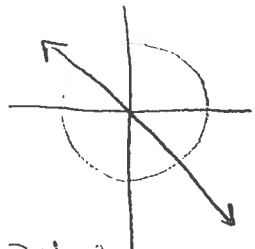
$\pi$  divided up into 3 equal pieces  
 ① { angle goes clockwise b/c negative

or

$$-\frac{4\pi}{3} \cdot \frac{180^\circ}{\pi \text{ rad}} = -\frac{4 \cdot 180}{3} = -4 \cdot 60 = -240^\circ$$



3. [3] (Circle Wks #4) Find the point(s) that are both on the unit circle and the line  $y = -x$ .



Picture  
+5

Recall  $(x,y)$  is on the unit circle if  $x^2 + y^2 = 1$  } +5

Since  $y = -x$  we can use substitution: } +5

$$x^2 + (-x)^2 = 1 \Rightarrow x^2 + x^2 = 1 \Rightarrow 2x^2 = 1 \text{ alg } +5$$

$$\Rightarrow x^2 = \frac{1}{2} \Rightarrow x = \pm\sqrt{\frac{1}{2}} \leftarrow \text{both answers } +5$$

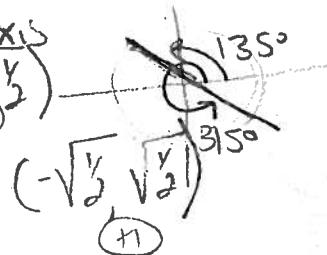
Since  $y = -x$  we know

or  $(\sqrt{\frac{1}{2}}, -\sqrt{\frac{1}{2}})$  and  $(-\sqrt{\frac{1}{2}}, \sqrt{\frac{1}{2}})$  } +5

+1 work/answer

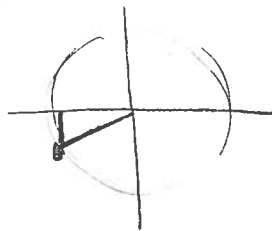
We're looking for the point on the unit circle that makes  $135^\circ$  or  $315^\circ$  w/ positive x-axis

Considering the unit circle then  $(\sqrt{\frac{1}{2}}, -\sqrt{\frac{1}{2}})$  or  $(-\sqrt{\frac{1}{2}}, \sqrt{\frac{1}{2}})$



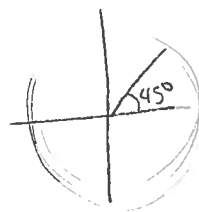
4. [2] (WebHW11 #12 & 15) Find the exact values for:

$$\sin\left(\frac{7\pi}{6} \text{ rad}\right)$$



Possible points  
Picture  
+5  
x & y coord  
+5

$$\cos(45^\circ)$$



$\sin\left(\frac{7\pi}{6} \text{ rad}\right)$  is the

y-coord.

(note the vert side is the short side?)

$\cos 45^\circ$

x-coord

(isosceles  $\Delta$ )

+5 {  $-\frac{1}{2}$

+5 {  $\sqrt{\frac{1}{2}} = \frac{1}{\sqrt{2}} = \frac{\sqrt{2}}{2}$  etc.