

The Unit Circle (4.2)

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Quiz 5

The Unit Circle (4.2)

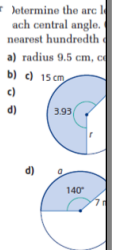
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#W: p175#16a, 22, 12cd, 13cd

2. A water wheel with diameter 3 m is used to measure the approximate speed of the water in a river. If the angular velocity of the wheel is 15 rpm, what is the speed of the river, in kilometres per hour?

16. Skytrek Adventure Park in Revelstoke, British Columbia, has a sky swing. Can you imagine a 170-ft flight that takes riders through a scary pendulum swing? At one point you are soaring less than 10 ft from the ground at speeds exceeding 60 mph.
- a) The length of the cable is 72 ft and you travel on an arc of length 170 ft on one particular swing. What is the measure of the central angle? Give your answer in radians, to the nearest hundredth.

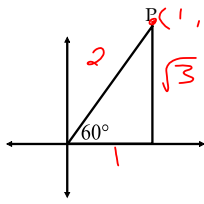


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let's remember a few things from 5.2iB



what are the co-ordinates of point P?

$$\sin 60^\circ = \frac{\sqrt{3}}{2}$$

$$\cos 60^\circ = \frac{1}{2}$$

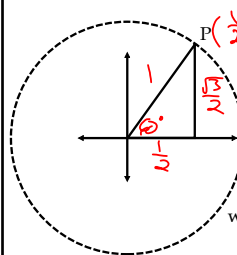
$$\tan 60^\circ = \frac{\sqrt{3}}{1}$$

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now we'll let the hypotenuse be 1



what are the co-ordinates of point P?

$$\sin 60^\circ = \frac{\sqrt{3}}{2}$$

$$\cos 60^\circ = \frac{1}{2}$$

$$\tan 60^\circ = \frac{\sqrt{3}}{1} = \sqrt{3}$$

We have a circle with radius 1, centred on the Origin.

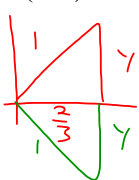
This is called the **Unit Circle**

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ex1: If $(\frac{2}{3}, y)$ is on the unit circle, find the value of y.



$$y = \sqrt{1^2 - (\frac{2}{3})^2}$$

$$= \sqrt{1 - \frac{4}{9}}$$

$$= \sqrt{\frac{5}{9}}$$

$$= \pm \frac{\sqrt{5}}{3}$$

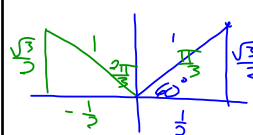
2ac
3ab

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ex2: Place our 60° special triangle in standard position and scale it so it fits on the unit circle.

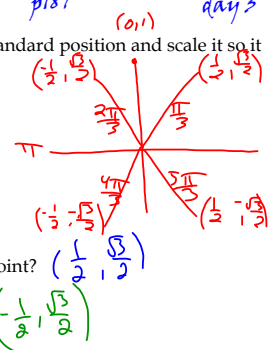


What is 60° in radians?

What are the co-ordinates of the endpoint? $(\frac{1}{2}, \frac{\sqrt{3}}{2})$

What are the co-ordinates of $\frac{2\pi}{3}$? $(-\frac{1}{2}, \frac{\sqrt{3}}{2})$

Do the rest of the family.



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HW: p187 #4abcd, 5aeg, 10