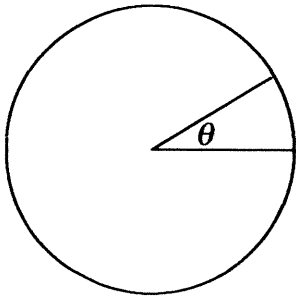
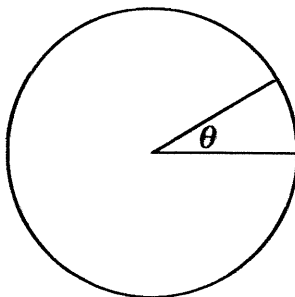


For each unit circle, θ is given. Carefully mark and label the angle specified (make sure the start and end of your arc are clear).

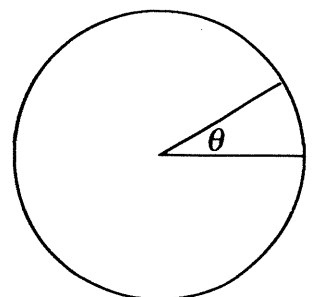
1. $\theta + \pi$



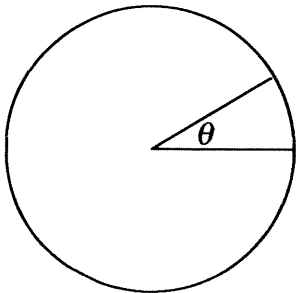
2. $\theta - \pi$



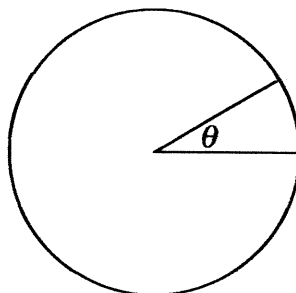
3. $-\theta$



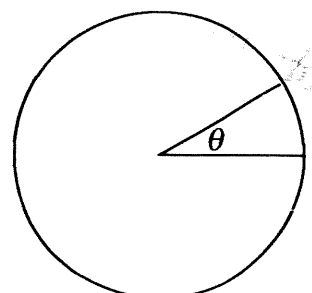
4. $\pi - \theta$



5. $\theta + \frac{\pi}{2}$



6. $\theta - \frac{\pi}{2}$



7. Choose one of the angles above and express sine and cosine of that angle in terms of θ .

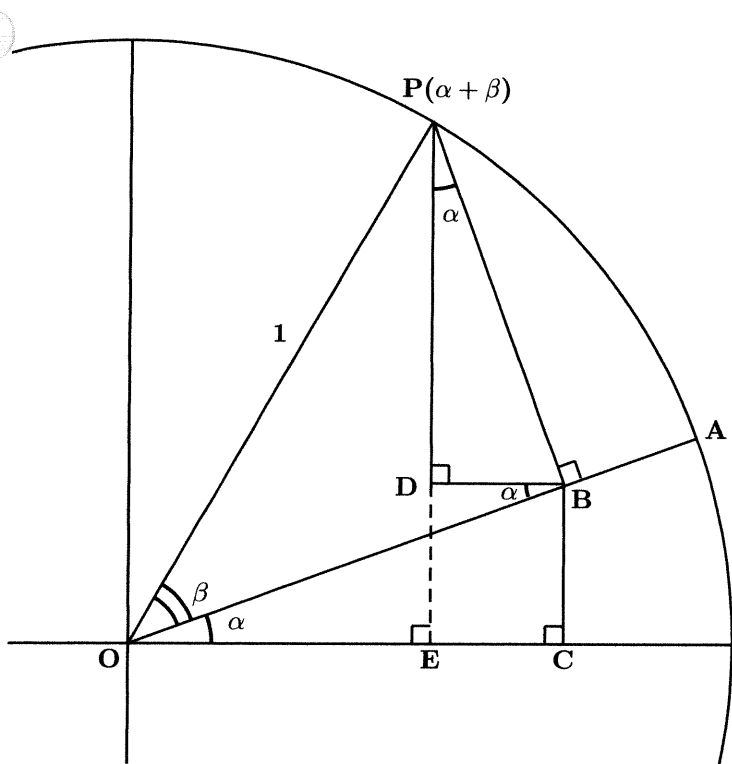
$\sin(\text{_____}) = \text{_____}$ $\cos(\text{_____}) = \text{_____}$

Solve for θ in the first quadrant (use degrees).

8. $\sin \theta = (\cos \theta)^2 + 0.3$ _____

9. $\tan \theta = 1.2 \sin \theta$ _____

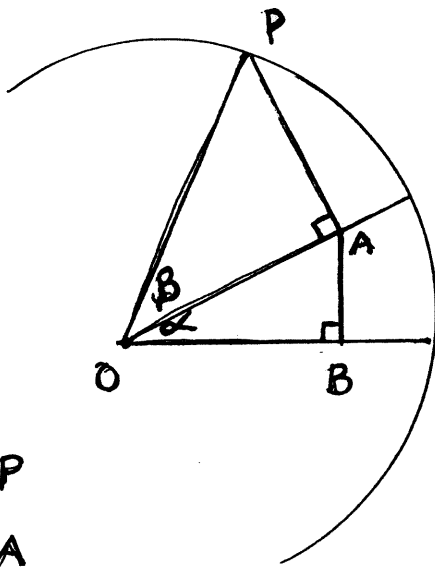
Math 151
Summation Trigonometric Identities



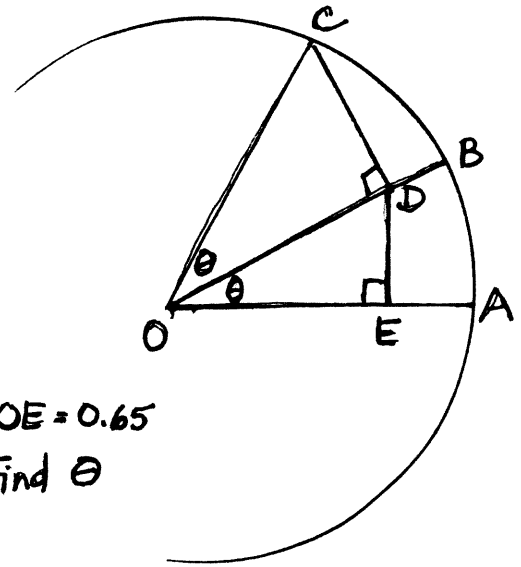
Use the diagram to derive
the Sum Identities:

$$\sin(\alpha + \beta) = \sin \alpha \cos \beta + \cos \alpha \sin \beta$$

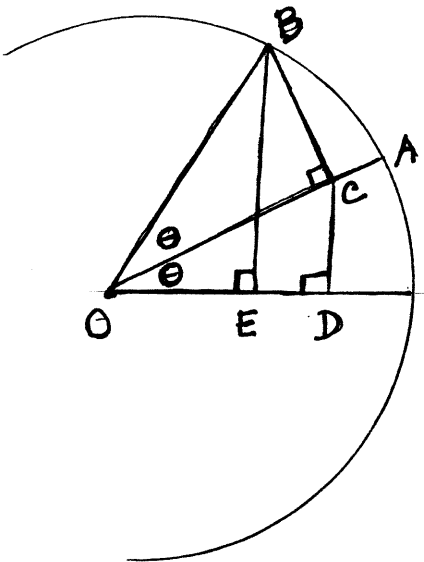
$$\cos(\alpha + \beta) = \cos \alpha \cos \beta - \sin \alpha \sin \beta$$



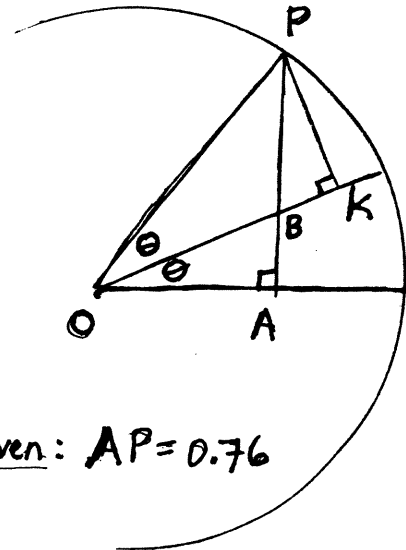
- (a) Find AP
- (b) Find OA
- (c) Find OB



$OE = 0.65$
Find θ



- (a) Find BE
- (b) Find OC
- (c) Find CD



Given: $AP = 0.76$

Find PK:

Find PB:

The Sum Identities (7.3.1):

(7.3.1A) $\sin(\alpha + \beta) = (\sin \alpha)(\cos \beta) + (\cos \alpha)(\sin \beta)$

(7.3.1B) $\cos(\alpha + \beta) = (\cos \alpha)(\cos \beta) - (\sin \alpha)(\sin \beta)$

Use the above identities to derive the following results. For each derivation, you may use any identity previously derived, but not the identity you are trying to prove.

(7.3.2A) $\sin(\alpha - \beta) = (\sin \alpha)(\cos \beta) - (\cos \alpha)(\sin \beta).$

Proof: $\sin(\alpha - \beta) =$

(7.3.2B) $\cos(\alpha - \beta) = (\cos \alpha)(\cos \beta) + (\sin \alpha)(\sin \beta).$

Proof: $\cos(\alpha - \beta) =$

(7.3.3A) $\sin 2\theta = 2(\sin \theta)(\cos \theta)$

Proof: $\sin 2\theta =$

(7.3.3B) $\cos 2\theta = \cos^2 \theta - \sin^2 \theta$

Proof: $\cos 2\theta =$

$$(7.3.3C) \quad \cos 2\theta = 1 - 2 \sin^2 \theta$$

Proof: $\cos 2\theta =$

$$(7.3.3D) \quad \cos 2\theta = 2 \cos^2 \theta - 1.$$

Proof:

$$(7.3.4A) \quad \sin^2 \theta = \frac{1 - \cos(2\theta)}{2}$$

Proof:

$$(7.3.4B) \quad \cos^2 \theta = \frac{1 + \cos(2\theta)}{2}$$

Proof:

$$(7.3.5A) \quad \sin\left(\frac{\theta}{2}\right) = \pm \sqrt{\frac{1 - \cos\theta}{2}}$$

Proof:

$$(7.3.5B) \quad \cos\left(\frac{\theta}{2}\right) = \pm \sqrt{\frac{1 + \cos\theta}{2}}$$

Proof: