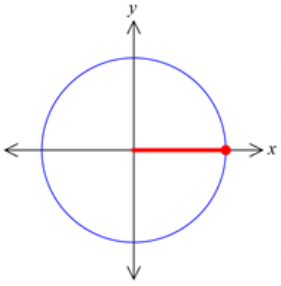
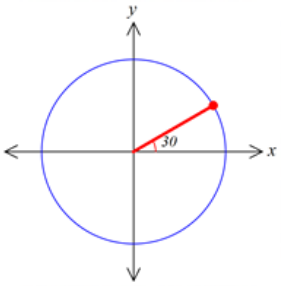
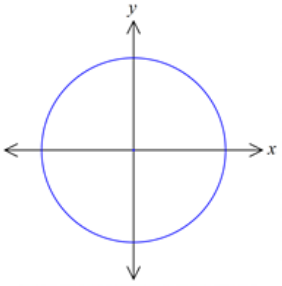
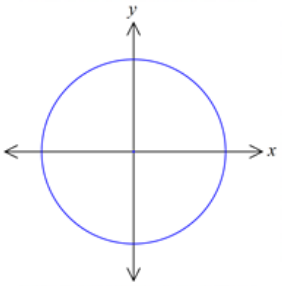
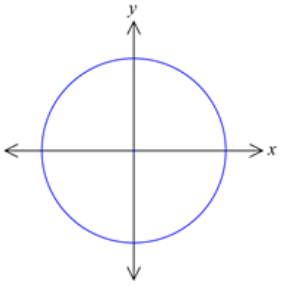
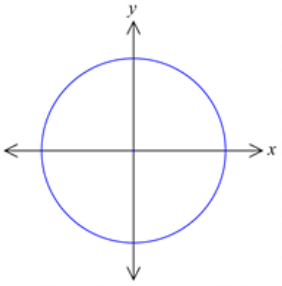
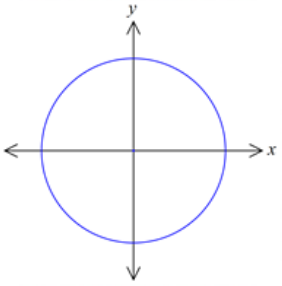
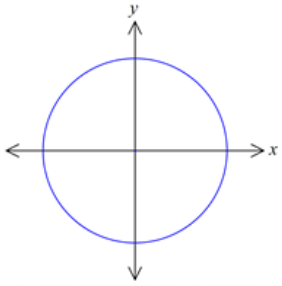
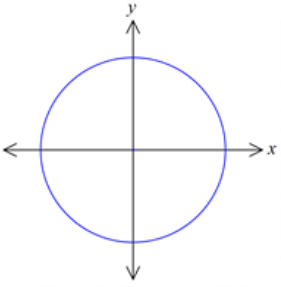
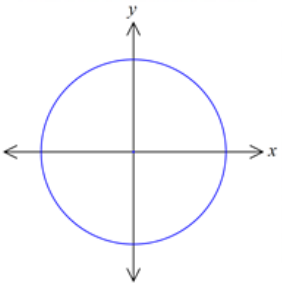
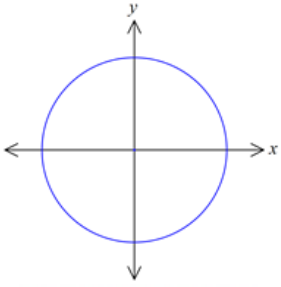
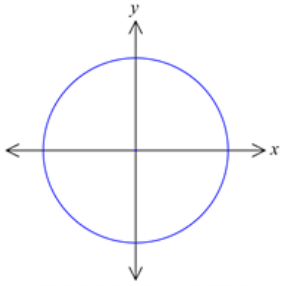
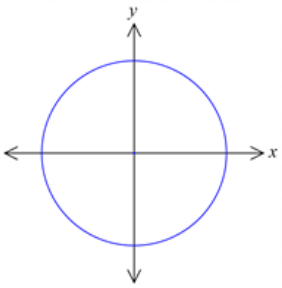
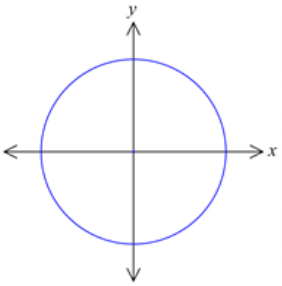
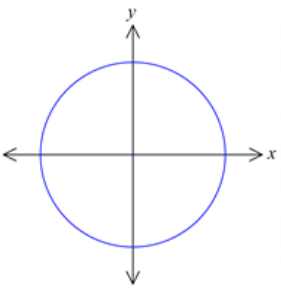
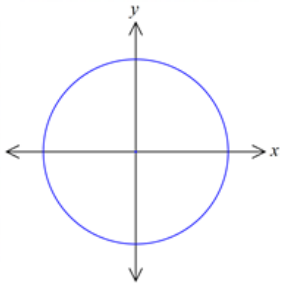
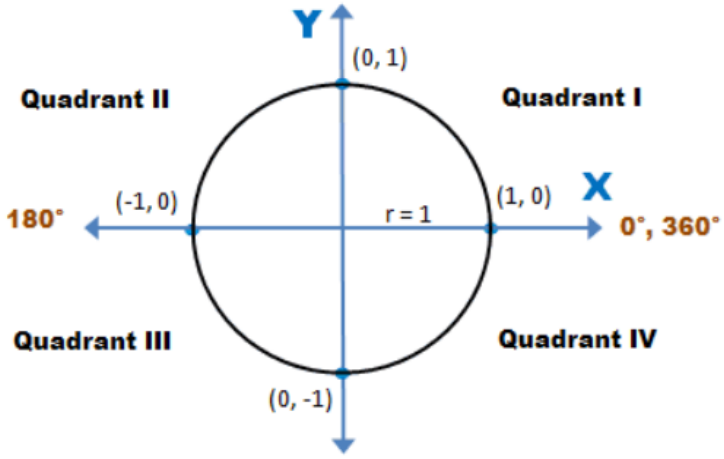
On each unit circle, draw the radius corresponding to each angle. The first two have been done for you.

0° 	**30°** 	**45°** 	**60°** 
90° 	**120°** 	**135°** 	**150°** 
180° 	**210°** 	**225°** 	**240°** 
270° 	**300°** 	**315°** 	**330°** 



QUESTION 1 Complete.

a In the _____ quadrant, all of the ratios are _____.

b In the _____ quadrant, sine is _____ but cosine and tangent are _____.

c In the _____ quadrant, tangent is _____ but sine and cosine are _____.

d In the _____ quadrant, cosine is _____ but sine and tangent are _____.

QUESTION 2 In which quadrant could θ lie if:

a $\sin\theta > 0,\ \cos\theta < 0$ _____ **b** $\tan\theta > 0,\ \sin\theta < 0$ _____

c $\cos\theta > 0,\ \sin\theta > 0$ _____ **d** $\tan\theta < 0,\ \cos\theta > 0$ _____

QUESTION 3 In which quadrant (1^{st}, 2^{nd}, 3^{rd}, 4^{th}) will the following angles lie?

a 110° _____ **b** 210° _____ **c** 49° _____ **d** 183° _____

e 308° _____ **f** 25° _____ **g** 97° _____ **h** 282° _____

QUESTION 4 Determine whether the given ratio will be positive or negative.

a $\sin 170°$ _____ **b** $\cos 280°$ _____ **c** $\tan 60°$ _____

d $\cos 104°$ _____ **e** $\tan 125°$ _____ **f** $\sin 315°$ _____

g $\tan 200°$ _____ **h** $\sin 56°$ _____ **i** $\cos 225°$ _____

j $\cos 70°$ _____ **k** $\tan 333°$ _____ **l** $\sin 264°$ _____

QUESTION 5 In which quadrant will the following angles lie?

a 385° _____ **b** 510° _____ **c** 456° _____ **d** 710° _____

e 755° _____ **f** 905° _____ **g** 410° _____ **h** 1000° _____

i −25° _____ **j** −135° _____ **k** −185° _____ **l** −300° _____

m −200° _____ **n** −79° _____ **o** −94° _____ **p** −265° _____

1 State whether each of these trigonometric ratios is positive or negative.

a $\sin 70°$ **b** $\cos 25°$ **c** $\tan 110°$ **d** $\cos 104°$

e $\tan 18°$ **f** $\sin 156°$ **g** $\tan 163°$ **h** $\sin 108°$

i $\sin 15°20'$ **j** $\tan 81°17'$ **k** $\cos 142°35'$ **l** $\tan 119°26'$

m $\cos 54°6'$ **n** $\sin 91°43'$ **o** $\cos 174°30'$ **p** $\sin 122°55'$

2 State whether the angle θ is acute or obtuse, where $0° < \theta < 180°$, if:

a $\sin\theta > 0$ and $\tan\theta > 0$ **b** $\sin\theta > 0$ and $\cos\theta < 0$

c $\tan\theta < 0$ and $\cos\theta < 0$ **d** $\cos\theta > 0$ and $\tan\theta > 0$

e $\sin\theta > 0$ and $\tan\theta < 0$ **f** $\sin\theta > 0$ and $\cos\theta > 0$

3 Express each of the following trigonometric ratios in terms of an acute angle.

a $\sin 100°$ **b** $\cos 140°$ **c** $\tan 160°$ **d** $\cos 125°$

e $\tan 134°$ **f** $\sin 152°$ **g** $\tan 101°$ **h** $\sin 115°$

i $\cos 108°$ **j** $\sin 164°$ **k** $\tan 122°$ **l** $\cos 171°$

5 Find two possible angles θ, where $0° < \theta < 180°$, correct to the nearest degree.

a $\sin\theta = 0.1564$ **b** $\sin\theta = 0.2657$ **c** $\sin\theta = 0.8371$

d $\sin\theta = 0.6049$ **e** $\sin\theta = 0.0695$ **f** $\sin\theta = 0.4224$

g $\sin\theta = 0.1827$ **h** $\sin\theta = 0.7599$ **i** $\sin\theta = 0.3914$

QUESTION 1 If $0° \leq \theta \leq 90°$ and $\sin\theta = 0.528$ write down the value of:

a $\sin(180° + \theta)$ **b** $\sin(360° - \theta)$ **c** $\sin(180° - \theta)$

QUESTION 2 If $0° \leq \alpha \leq 90°$ and $\tan\alpha = 1.237$ write down the value of:

a $\tan(180° - \alpha)$ **b** $\tan(360° - \alpha)$ **c** $\tan(180° + \alpha)$

d $\tan(-\alpha)$ **e** $\tan(360° + \alpha)$

QUESTION 3 Given that $\cos 60° = 0.5$ find:

a $\cos 240°$ **b** $\cos 120°$ **c** $\cos 300°$ **d** $\cos 420°$

QUESTION 4 If $\sin 23° = 0.391$ (correct to 3 decimal places), write down the value, to 3 decimal places, of:

a $\sin 337°$ **b** $\sin 203°$ **c** $\sin(-23°)$ **d** $\sin 157°$

e $\sin 383°$ **f** $\sin 563°$ **g** $\sin(-157°)$ **h** $\cos 67°$

Find two possible angles α, where $0 < \alpha < 360$, correct to the nearest degree.

$\cos\alpha = 0.4578$ $\cos\alpha = 0.1234$ $\cos\alpha = -0.56$

6 Find the obtuse angle θ, correct to the nearest degree.

a $\cos\theta = -0.5218$ **b** $\tan\theta = -0.1243$ **c** $\cos\theta = -0.1921$