

Warm-up

The average speed of a runner in the 4K race was 10 mph. Set up a normal distribution curve with a standard deviation of 2 miles per hour.

Determine how many runners ran:

Between 12 mph and 16 mph. 16%

More than 14 mph. 2.5%

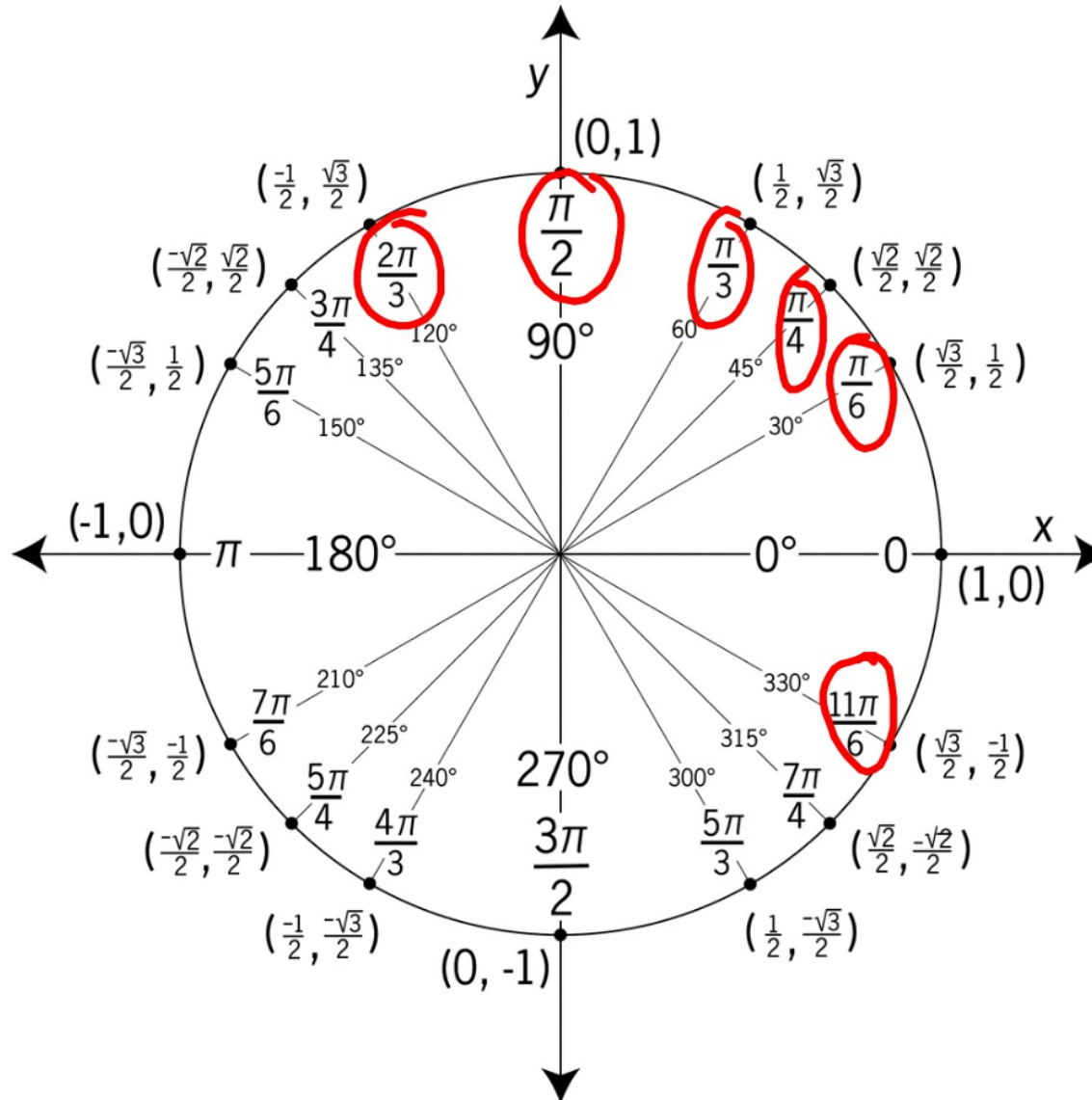
Less than 8 mph. 16%

Between 4 mph and 14 mph.

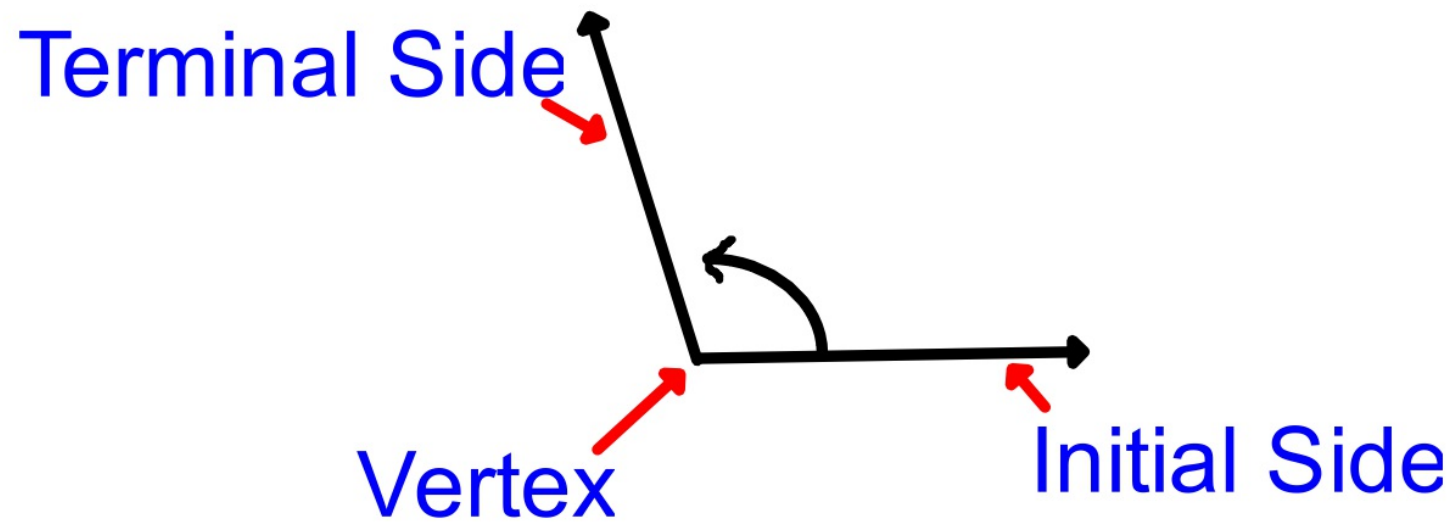
97.5%

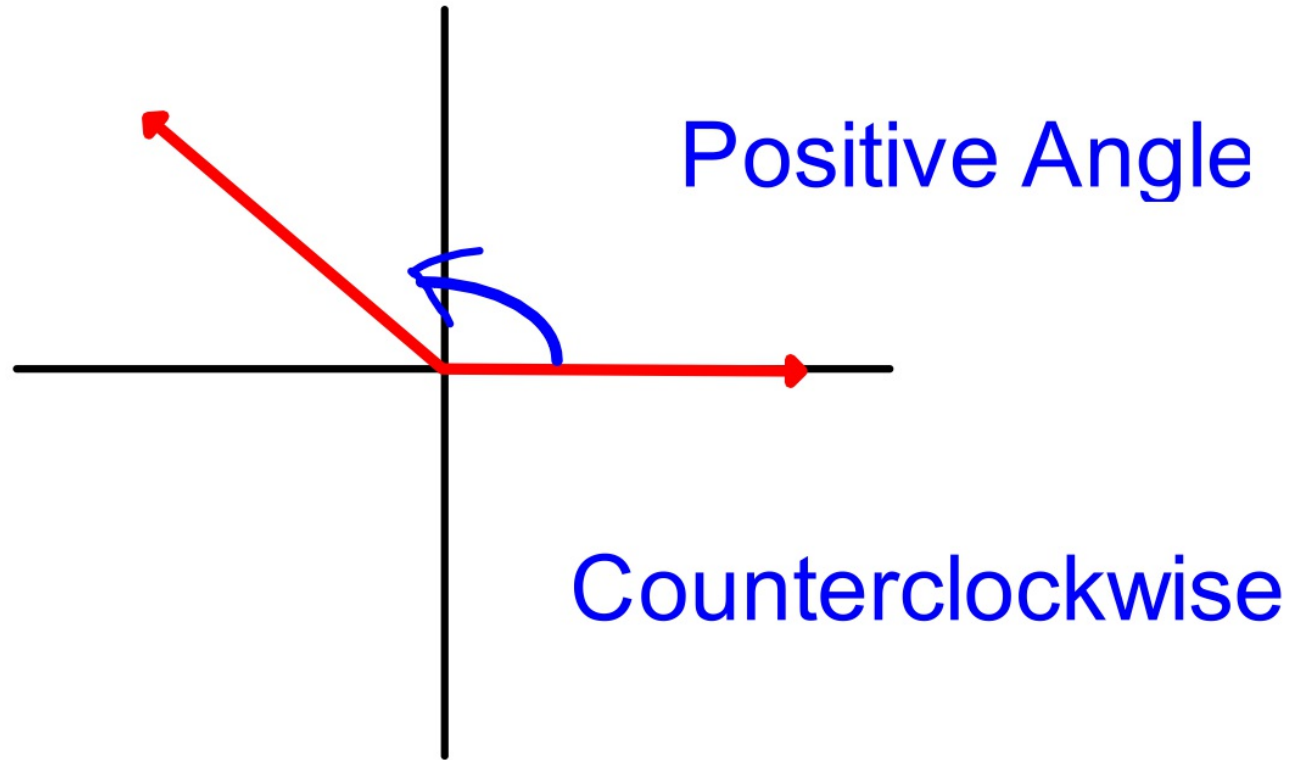
Welcome to Unit 3

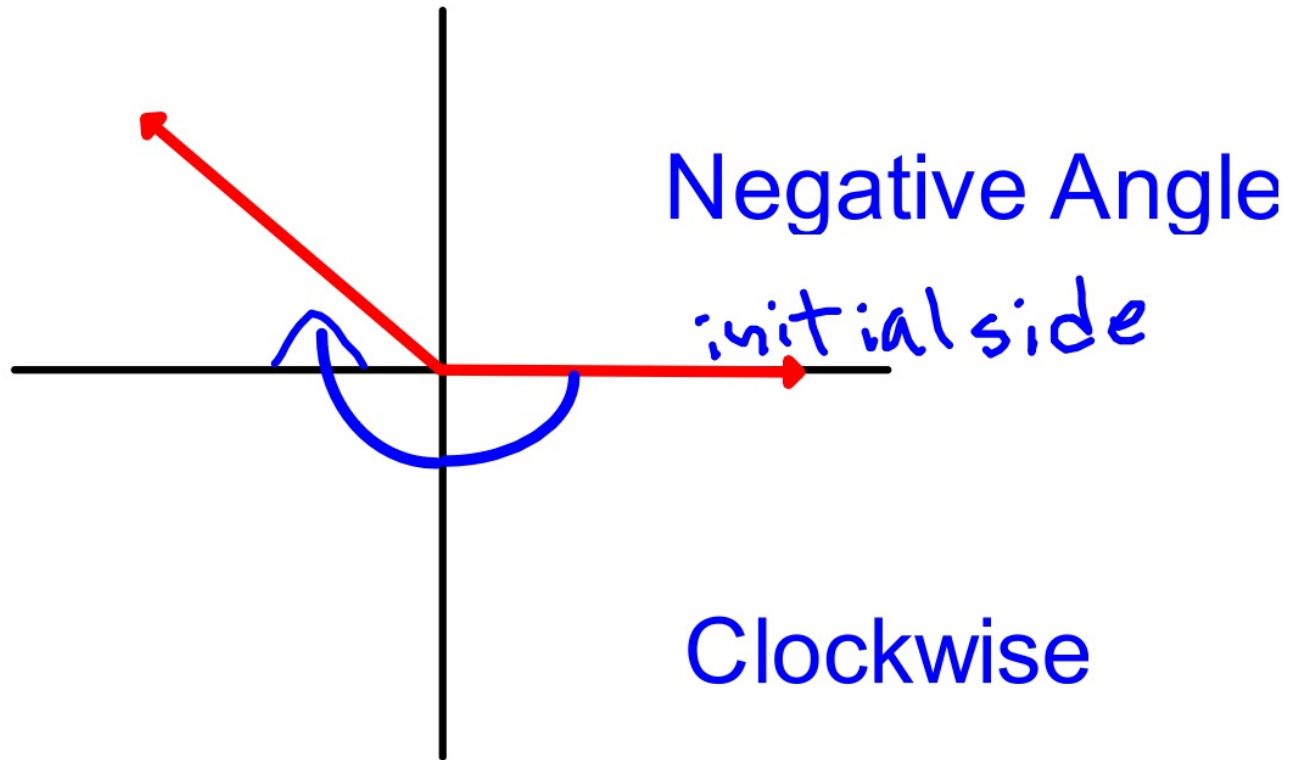
Trigonometry



Parts of an angle:







Converting from DMS to Degrees

DMS: Degree-minute-second

' = minute " = second

$1^{\circ} = 60'$

Degree to DMS: 56.735°

1) Take the part after the decimal and multiply by 60.

$$.735 \times 60 = \underline{44.1}$$

2) Take the part after the decimal and multiply by 60 again.

$$.1 \times 60 = \underline{6}$$

$$56^{\circ} 44' 6''$$

DMS to Degree: $32^{\circ}5'28''$

minutes

seconds

1) Divide the ' by 60 and the '' by 3600 and add them all together.

$$32 + \frac{5}{60} + \frac{28}{3600} =$$

3600 seconds
in a degree

$$32.091^{\circ}$$

Practice

1) DMS to Degree: $89^{\circ}56'7''$

$$89 + \frac{56}{60} + \frac{7}{3600} =$$

$$89.935^{\circ}$$

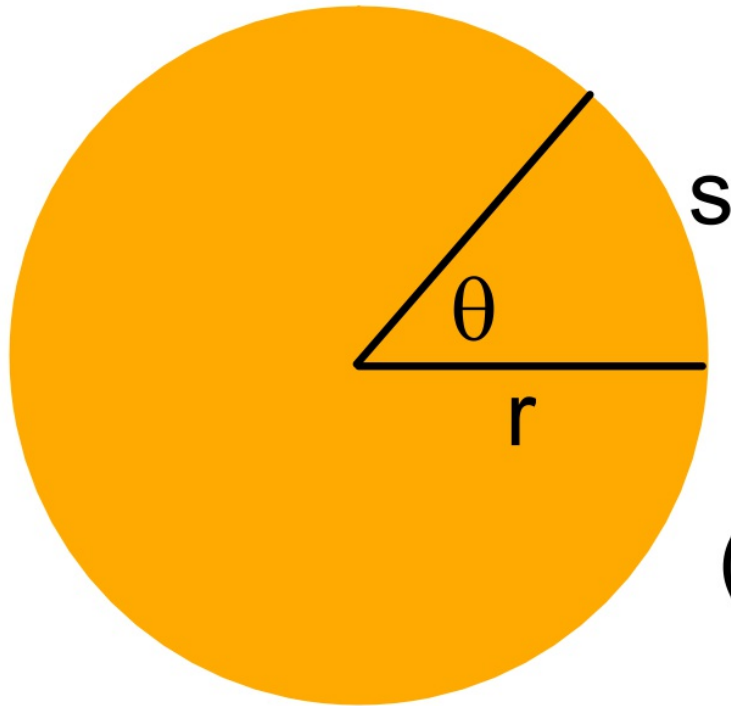
2) Degree to DMS: 213.875°

$$213^{\circ} 52' 30''$$

$$.875 \times 60 = \underline{52.5}$$

$$.5 \times 60 = 30$$

Radian to Degree



$$\theta = s/r$$

r =radius

s =arc length

(Radian usually
has π in it)

Radian to Degree: $5\pi/6$ rad

Multiply by $180/\pi$.

=

$$\frac{5\cancel{\pi}}{6} \cdot \frac{180}{\cancel{\pi}} = \frac{5 \cdot 180}{6} = 150^\circ$$

Degree to Radian:

Multiply by $\pi/180$.

$$120^\circ \cdot \frac{\pi}{180} = \frac{2\pi}{3}$$

Practice

1. Rad to Degree: $-3\pi/2$

$$-\frac{3\pi}{2} \cdot \frac{180}{\pi} = -\frac{3 \cdot 180}{2} = -270$$

2. Degree to Rad: -60°

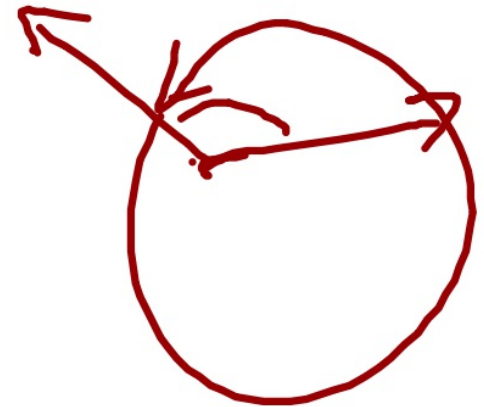
$$-\frac{60}{1} \cdot \frac{\pi}{180} = -\frac{1\pi}{3} = -\frac{\pi}{3}$$

Coterminal Angles

Degree: Add or Subtract $360n$

Radian: Add or Subtract $2\pi n$

where n is an integer.



Identify all angles that are coterminal with the given angle.

1) 45°

$$45 + 360n$$

$$45 + 360 = 405^\circ \quad 45+$$

$$45 - 360 = -315^\circ \quad 45+$$

2) $-\pi/3$

$$-\frac{\pi}{6} + 2\pi$$
$$-\frac{\pi}{6} + \frac{12}{6} = \frac{11\pi}{6}$$

$$\frac{\pi}{3} + 2\pi$$
$$-\frac{\pi}{3} + \frac{6\pi}{3} = \frac{5\pi}{3}$$

Warm-up Complete on Warm-up Tracker

1) -30°

$$-30 \cdot \frac{\pi}{180} = -\frac{1\pi}{6} = -$$

a) Convert to radians

b) Find two coterminal angles

$$-30 - 360 = -390 \quad -30 + 360 = 330$$
$$-30 + 360n$$

2) $3\pi/4$

$$\frac{3\pi}{4} \cdot \frac{180}{\pi} = \frac{540}{4} = 135$$

a) Convert to degrees

b) Find two coterminal angles

$$\frac{3\pi}{4} + 2\pi = \frac{11\pi}{4}$$

$$\frac{3\pi}{4} - 2\pi = \frac{3\pi}{4} - \frac{8\pi}{4} = -\frac{5\pi}{4}$$

Write each decimal degree measure in DMS form and each DMS measure in decimal degree form to the nearest thousandth. (Example 1)

1. 11.773°

2. 58.244°

3. 141.549°

4. 273.396°

5. $87^\circ 53' 10''$

6. $126^\circ 6' 34''$

7. $45^\circ 21' 25''$

8. $301^\circ 42' 8''$

Write each degree measure in radians as a multiple of π and each radian measure in degrees. (Example 2)

11. 225°

13. -45°

15. $\frac{5\pi}{2}$

17. $-\frac{7\pi}{6}$

Identify all angles that are coterminal with the given angle. Then find ~~and draw~~ one positive and one negative angle coterminal with the given angle. (Example 3)

18. 120°

19. -75°

20. 225°

21. -150°

22. $\frac{\pi}{3}$

23. $-\frac{3\pi}{4}$

24. $-\frac{\pi}{12}$

25. $\frac{3\pi}{2}$

