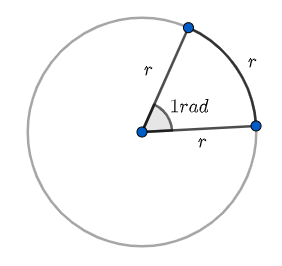
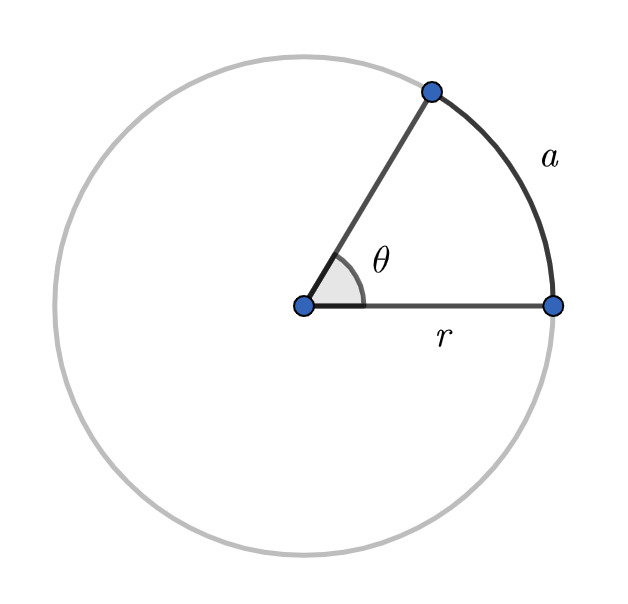
**4.1 – ANGLES AND ANGLE MEASURE**

**Definition**: 1 radian is the measure of the central angle subtended by an arc equal in length to the radius of the circle.

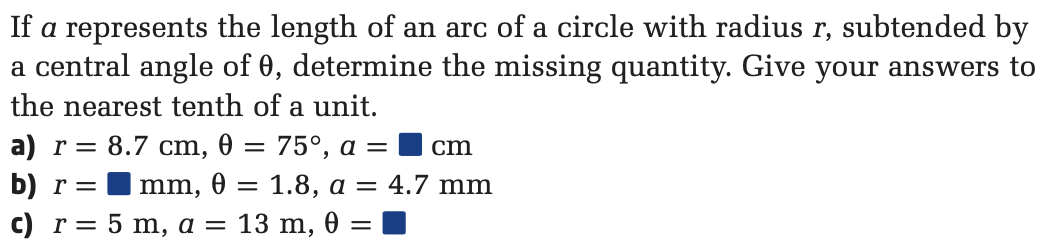




**Arc length of a circle:**

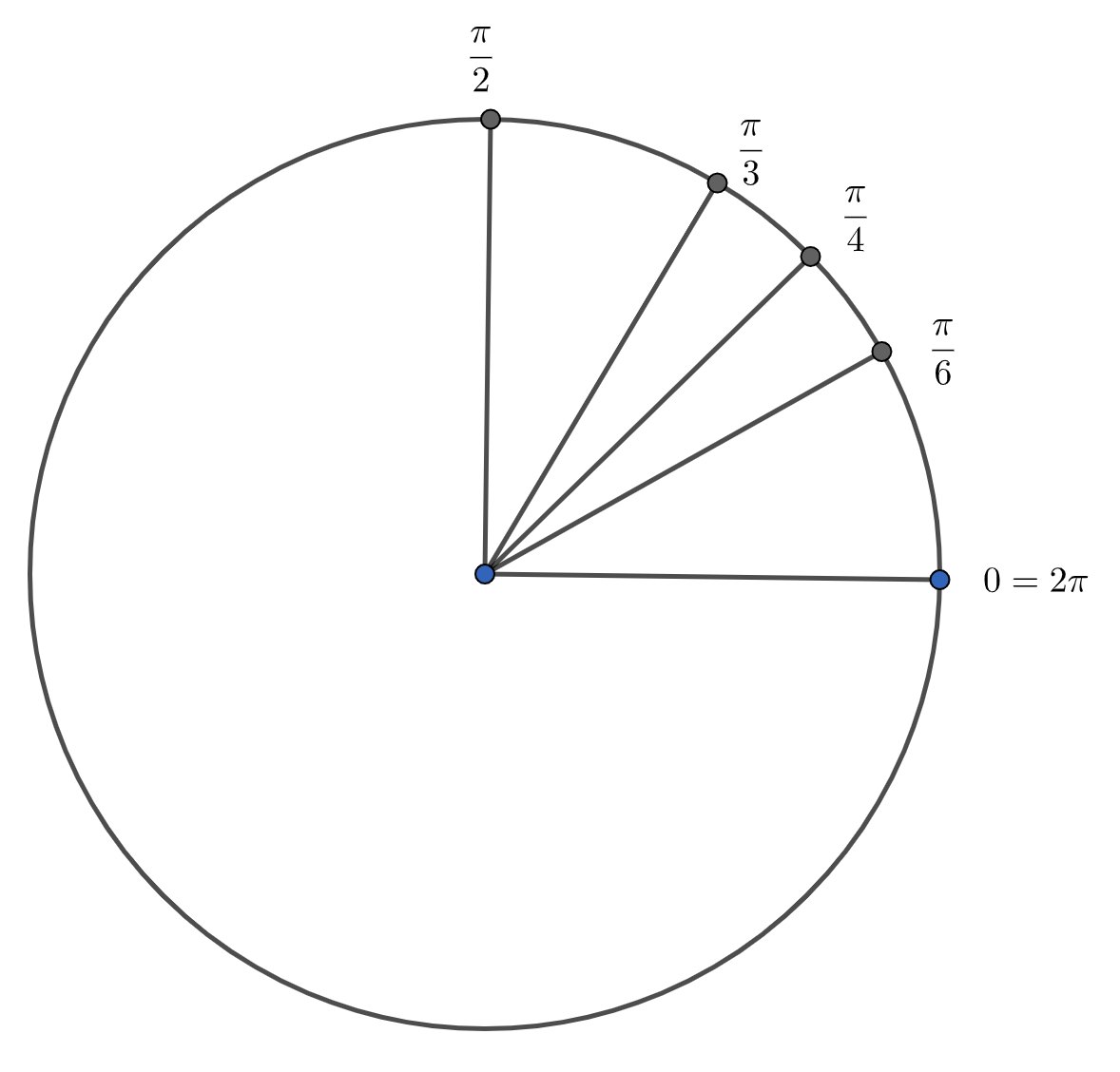
If the angle is expressed in radians, we get:

Your turn p 174 ( answers: a) , b) , c) )



Note, if the circle has radius 1 (unit circle), then the angle in radians and the arc length have the same value.

**Conversions to know by heart:**



|  |  |
| --- | --- |
| Degrees | Radians |
| 360o |  |
| 180o |  |
| 90o |  |
| 60o |  |
| 45o |  |
| 30o |  |

**Conversions:**

To convert from radians to degrees or from degrees to radians, we can always use cross multiplication with the reference 180o 🡨🡪 .

But some conversions can be deducted from recognizing the special angles multiples…

Examples:

a) 50o c)   
  
  
b) d) 3.2   
 e) 120o  g)   
  
  
 f) -150o h)

Your turn p 169



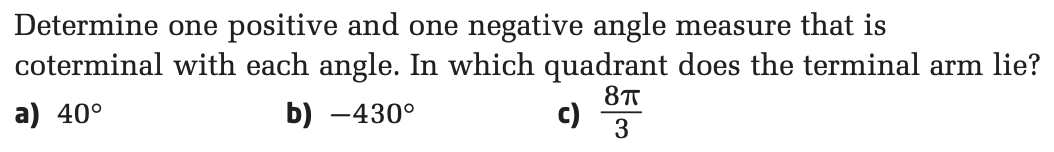
When 2 angles in standard position have the same terminal arm, we call them **coterminal angles**.

They differ by full rotations (360o or or their multiples depending on the unit used).

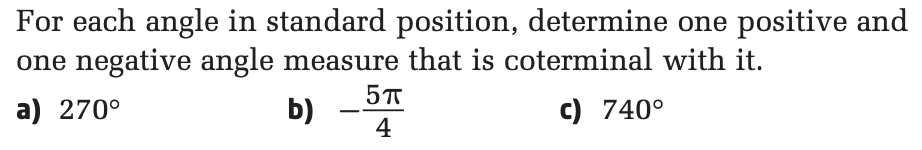
Examples: 30o and 750o are coterminal angles

and are coterminal angles

Example 2 p 170



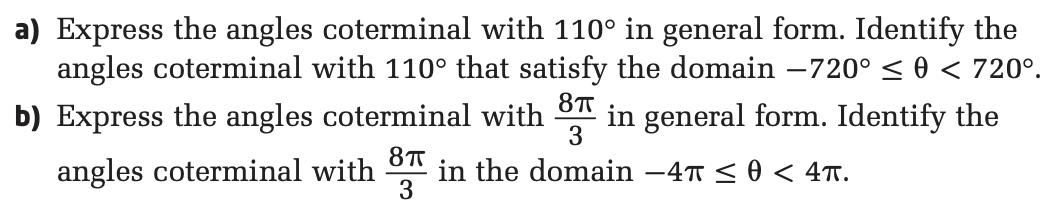
Your turn p 171



For any angle , there is an infinity of coterminal angles. When asked for all of them, we give their **general form**:

in degrees or in radians

Example 3 p 172



**Hwk: p 175 # 2 – 4, 6 – 11, 13 – 16, …**