Answers: Introduction to radians

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Summary

Answers to the questions relating to the guide on radians.

These are the answers to Questions: Introduction to radians.

Please attempt the questions before reading these answers!

Q1

1.1. Multiplying 30° by π and dividing by 180 gives $\frac{30\pi}{180}$ rad $= \frac{\pi}{6}$ rad $= 0.524$ rad to three decimal places.

1.2. Multiplying 105° by π and dividing by 180 gives $\frac{105\pi}{180}$ rad $= \frac{7\pi}{12}$ rad $= 1.833$ rad to three decimal places.

1.3. Multiplying 298° by π and dividing by 180 gives $\frac{298\pi}{180}$ rad $= \frac{149\pi}{90}$ rad $= 5.201$ rad to three decimal places.

1.4. Multiplying 61° by π and dividing by 180 gives $\frac{61\pi}{180}$ rad $= 1.064$ rad to three decimal places.

1.5. Multiplying 353° by π and dividing by 180 gives $\frac{353\pi}{180}$ rad $= 6.161$ rad to three decimal places.

1.6. Multiplying 197° by π and dividing by 180 gives $\frac{197\pi}{180}$ rad $= 3.438$ rad to three decimal places.

Q2

2.1. Multiplying $\frac{\pi}{3}$ rad by 180 and dividing by π gives $\frac{180\pi}{3\pi}^\circ = 60^\circ$.

2.2. Multiplying $\frac{2\pi}{3}$ rad by 180 and dividing by π gives $\frac{360\pi}{3\pi}^\circ = 120^\circ$.

2.3. Multiplying $\frac{\pi}{7}$ rad by 180 and dividing by π gives $\frac{180\pi}{7\pi}^\circ = 25.714^\circ$ to three decimal places.

2.4. Multiplying $\frac{5\pi}{7}$ rad by 180 and dividing by π gives $\frac{900\pi}{7\pi}^{\circ} = 128.571^{\circ}$ to three decimal places.

2.5. Multiplying 5 rad by 180 and dividing by π gives $\frac{900}{\pi}^{\circ} = 286.479^{\circ}$ to three decimal places.

2.6. Multiplying $\frac{3}{4}$ rad by 180 and dividing by π gives $\frac{540}{4\pi}^{\circ} = \frac{135}{\pi}^{\circ} = 42.972^{\circ}$ to three decimal places.

Q3

3.1. In this case, the length of the arc is $\frac{7\pi}{8} = 2.749$ (to 3dp) and the area of the sector is $\frac{49\pi}{16} = 9.621$ (to 3dp).

3.2. In this case, the length of the arc is $\frac{\pi}{2} = 1.571$ (to 3dp) and the area of the sector is $\frac{\pi}{12} = 0.262$ (to 3dp).

3.3. In this case, the length of the arc is $14\pi = 43.982$ (to 3dp) and the area of the sector is $\frac{525\pi}{2} = 824.668$ (to 3dp).
