

Precalculus

The inequality $b \geq \sin \theta \geq a$

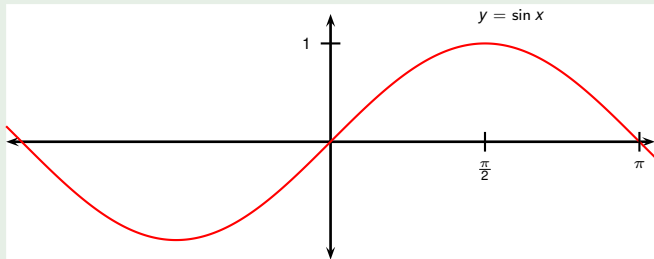
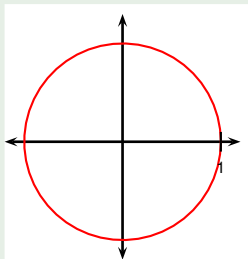
Todor Milev

2019

Example

Solve. Among your solutions, find those between -360° and 450° .

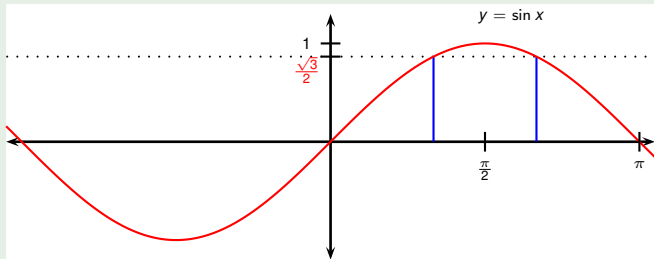
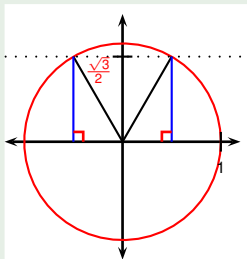
$$\frac{1}{2} \leq \sin \theta < \frac{\sqrt{3}}{2}$$



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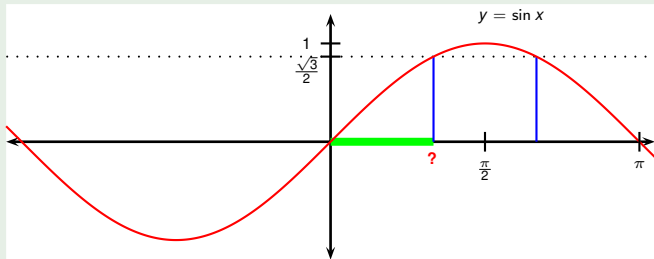
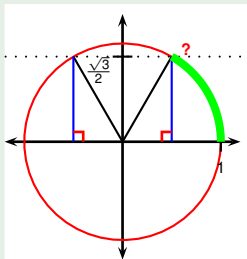
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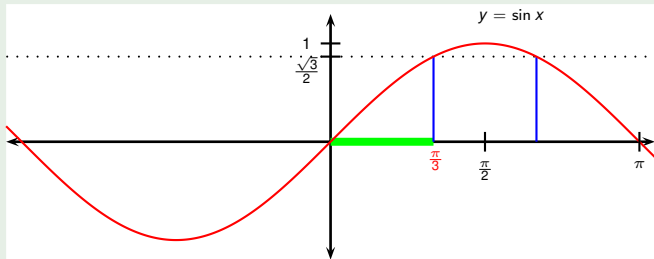
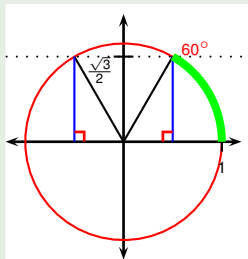
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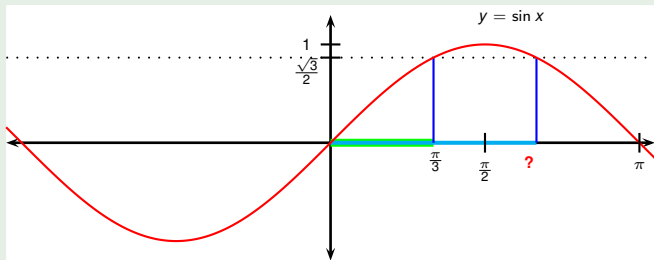
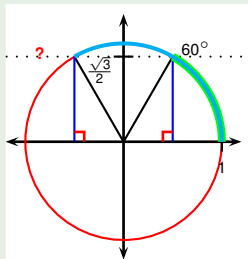
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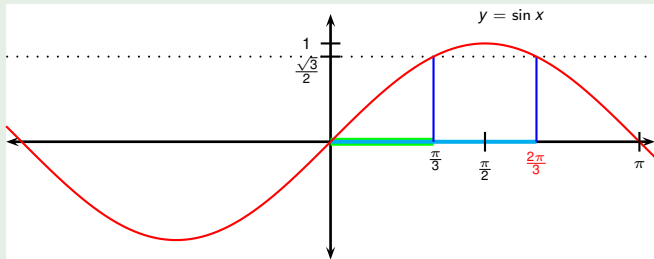
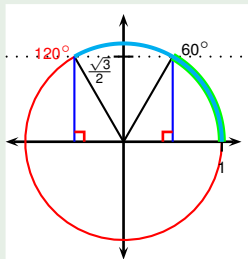
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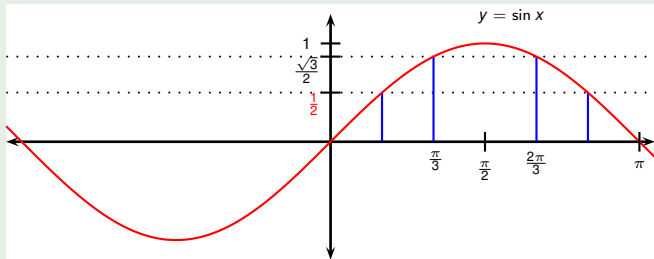
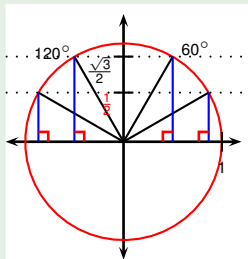
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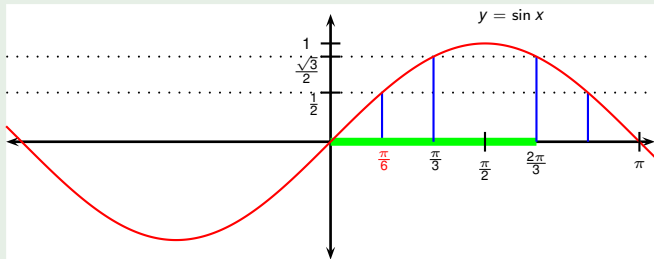
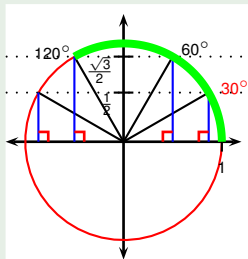
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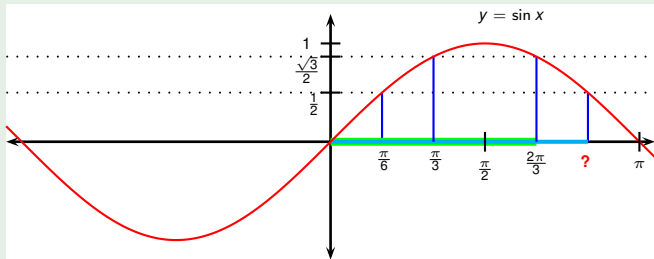
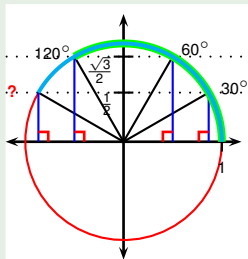
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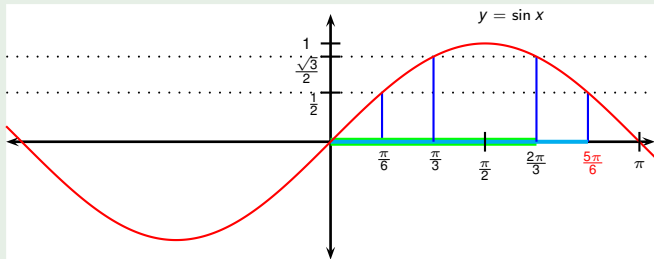
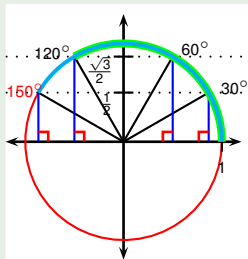
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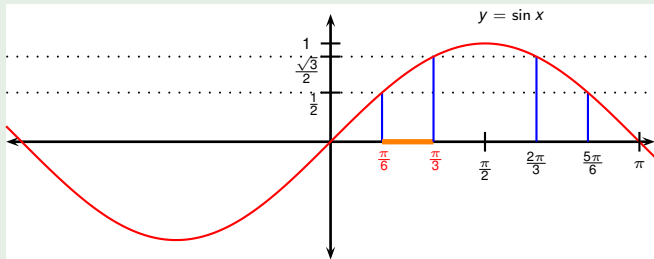
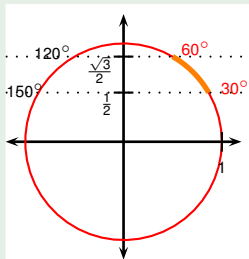


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$$\frac{1}{2} \leq \sin \theta < \frac{\sqrt{3}}{2}$$

$$x \in [30^\circ, 60^\circ) \quad)$$

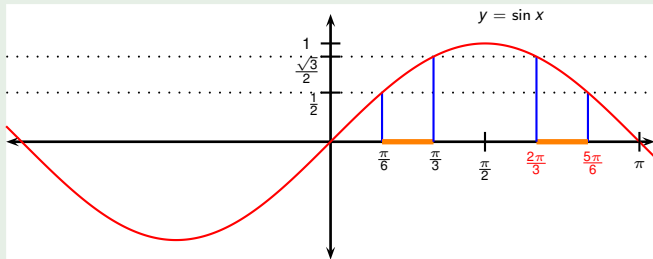
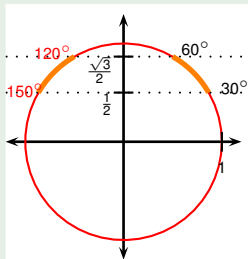


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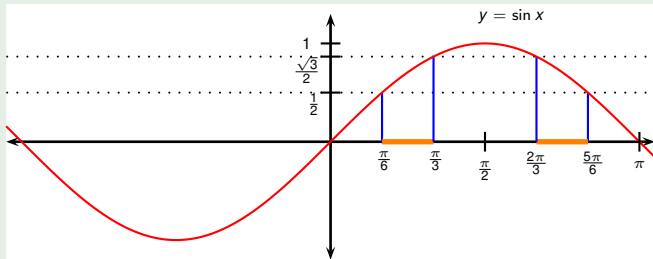
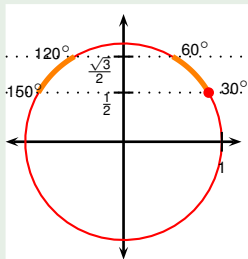


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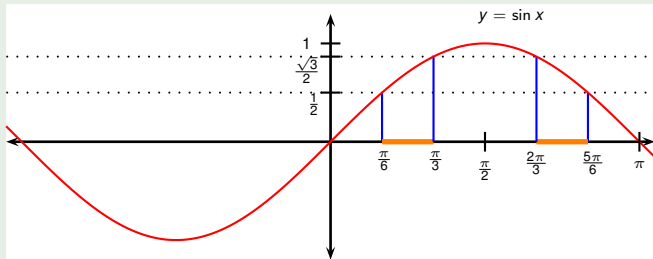
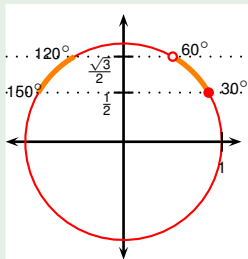


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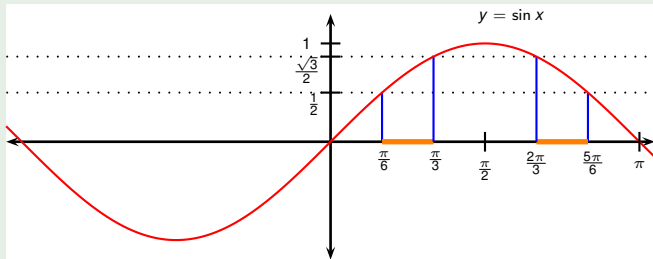
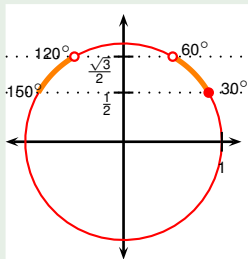


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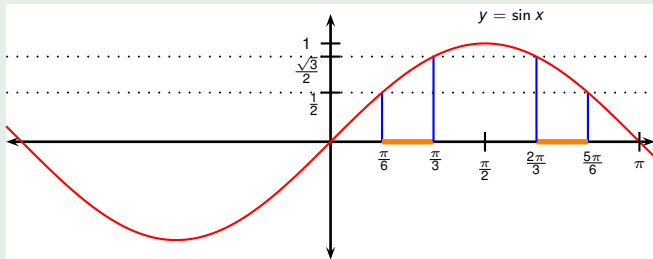
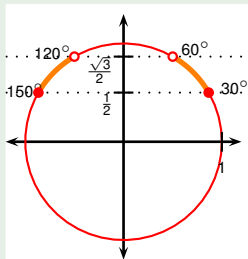


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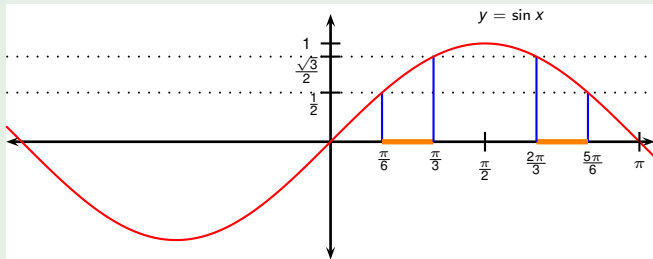
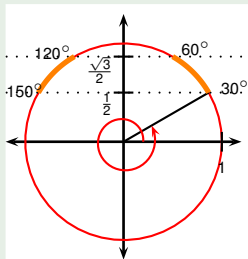


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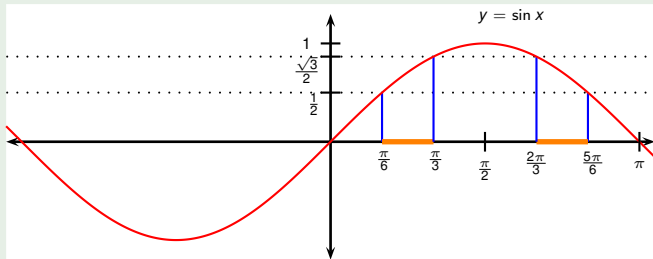
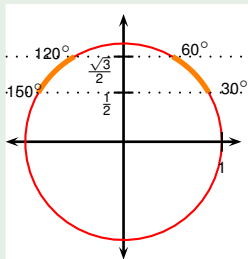
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$$x \in [30^\circ, 60^\circ) \cup (120^\circ, 150^\circ] \quad | \quad k = 0$$



Example

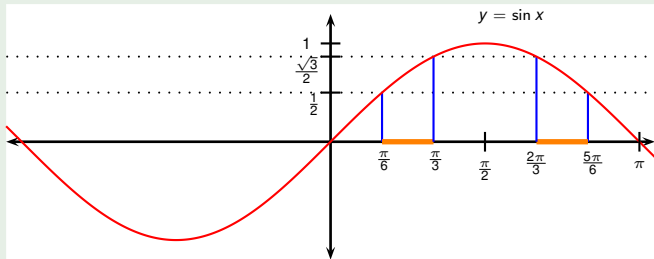
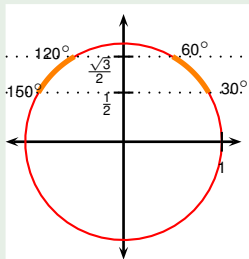
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$$x \in [30^\circ, 60^\circ) \cup (120^\circ, 150^\circ] \quad \left| \begin{array}{l} k = 0 \\ k = 1 \end{array} \right.$$

$$\cup [390^\circ, 420^\circ) \cup (480^\circ, 510^\circ]$$



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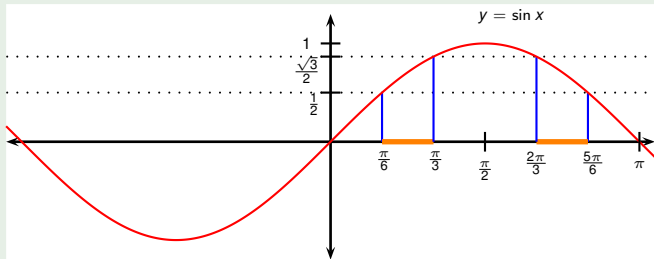
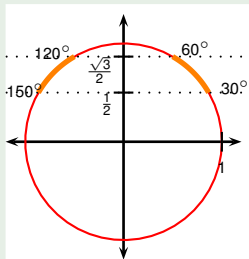
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$$k = 1$$

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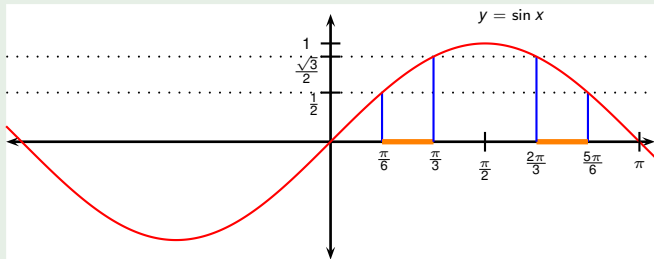
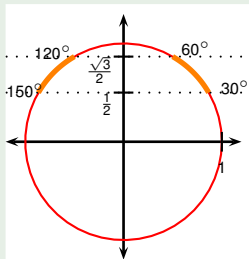
$$x \in \begin{aligned} &[-330^\circ, -300^\circ) \cup (-240^\circ, -210^\circ] \\ &\cup [30^\circ, 60^\circ) \cup (120^\circ, 150^\circ] \\ &\cup [390^\circ, 420^\circ) \cup (480^\circ, 510^\circ] \end{aligned}$$

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$$k = -1$$

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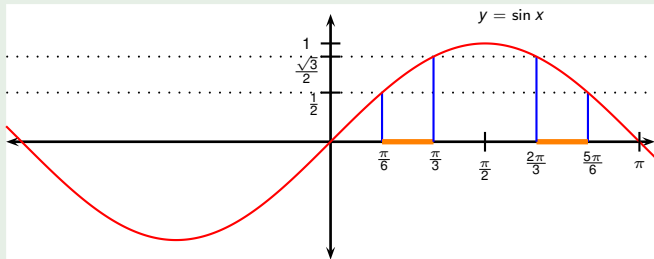
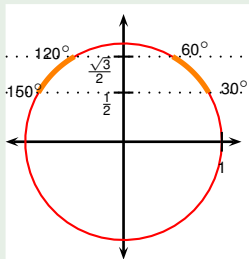
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$$k = -2$$

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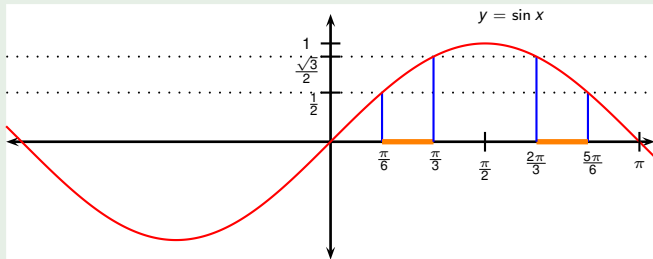
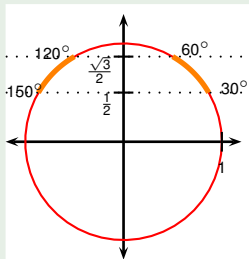
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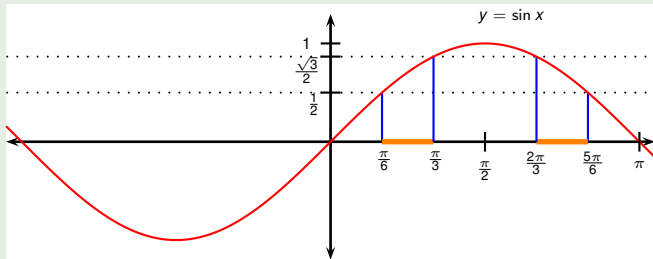
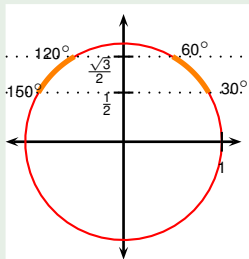
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 \end{array}
 \quad \left| \begin{array}{l} k = -2 \\ k = -1 \\ k = 0 \\ k = 1 \end{array} \right.$$

In radians:

$$x \in \left[-\frac{11\pi}{6}, -\frac{5\pi}{3}\right) \cup \left[-\frac{4\pi}{3}, -\frac{7\pi}{6}\right) \cup \left[\frac{\pi}{6}, \frac{\pi}{3}\right) \cup \left[\frac{2\pi}{3}, \frac{5\pi}{6}\right) \cup \left[\frac{13\pi}{6}, \frac{7\pi}{3}\right)$$