

# Calculus II

## Simplify $\arcsin(\sin(x))$

Todor Milev

2019

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Find  $\arcsin(\sin(1.5))$ .

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●  $\frac{\pi}{2} \approx ?$

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- $\frac{\pi}{2} \approx 1.57$ .
- Therefore  $-\frac{\pi}{2} \leq 1.5 \leq \frac{\pi}{2}$ .

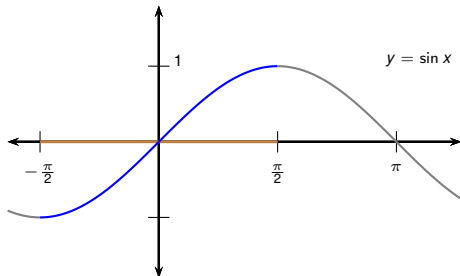
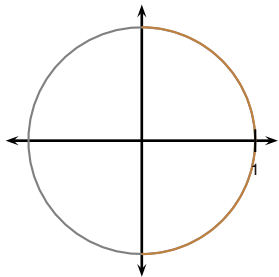
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Find  $\arcsin(\sin(1.5))$ .

- $\frac{\pi}{2} \approx 1.57$ .
- Therefore  $-\frac{\pi}{2} \leq 1.5 \leq \frac{\pi}{2}$ .
- Therefore  $\arcsin(\sin 1.5) = 1.5$ .

## Example

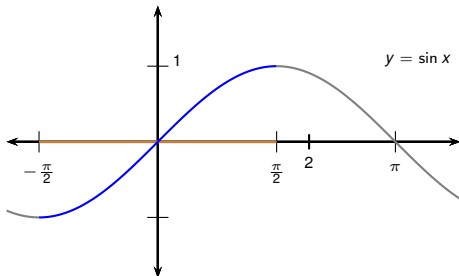
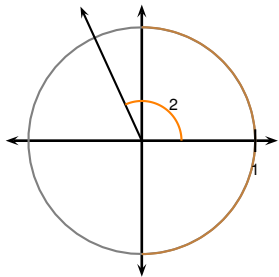
Find  $\arcsin(\sin 2)$ .



## Example

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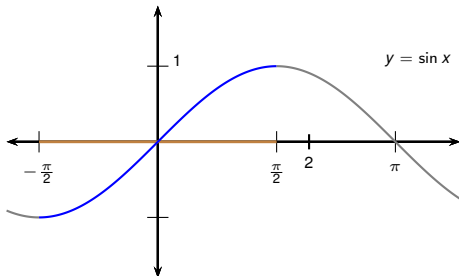
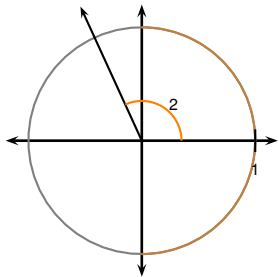




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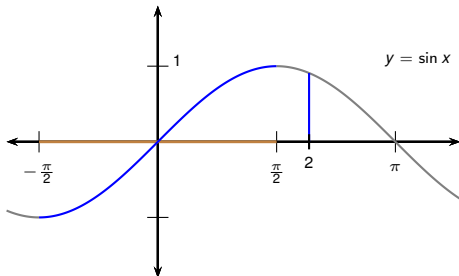
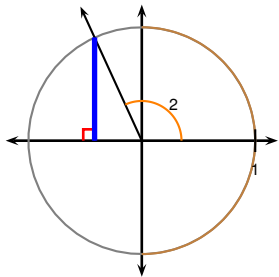
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- We need the angle  $a$  between  $-\frac{\pi}{2}$  and  $\frac{\pi}{2}$  for which  $\sin 2 = \sin a$ .



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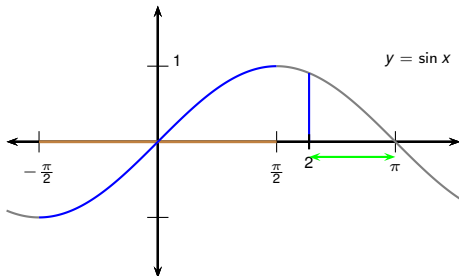
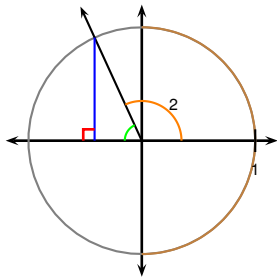
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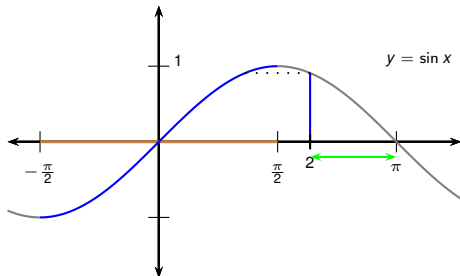
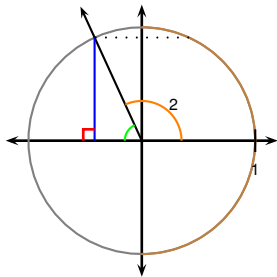
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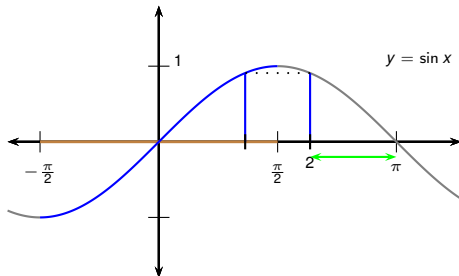
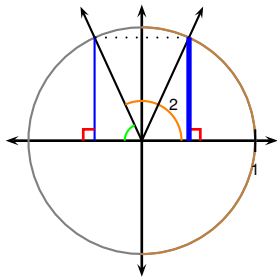
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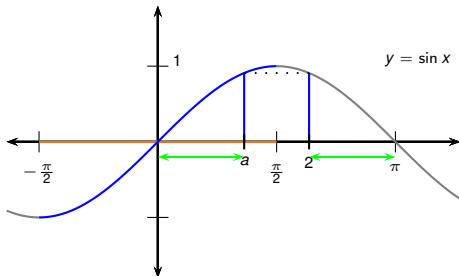
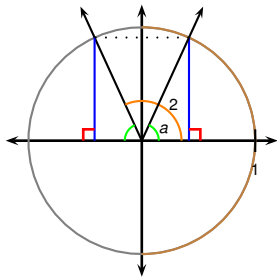
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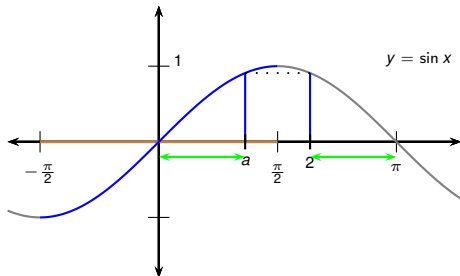
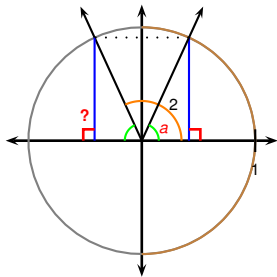


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$$a = ?$$

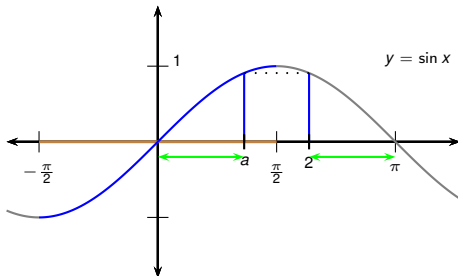
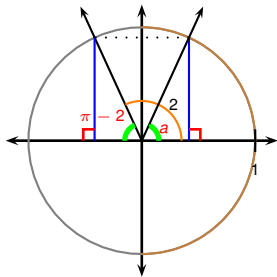


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$$a = \pi - 2.$$





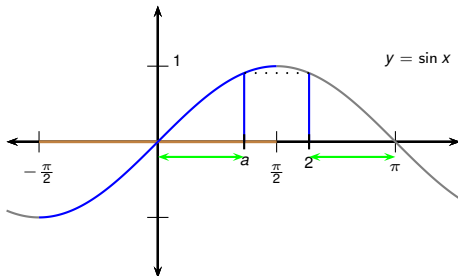
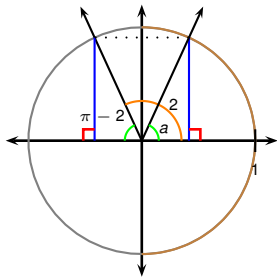
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$$\text{Therefore } \arcsin(\sin 2) = \arcsin(\sin a)$$



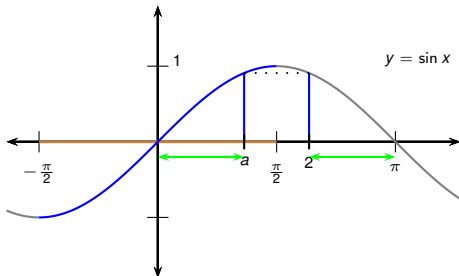
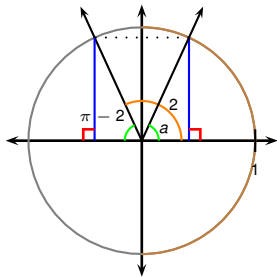
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