Lecture 34: Inverse trig function

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Question 1.

What is $\sin^{-1}(x)$?

- A The reciprocal $1/\sin(x)$ or $\csc(x)$.
- **B** The function $f(x) = \sin(1/x)$.
- C An inverse function.
- D The function formerly known as arcsin.

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- C or D.

Question 2.

Find
$$\sin^{-1}(\frac{\sqrt{3}}{2})$$
.
A 1/2
B $\pi/3$
C $\pi/4$
D $\pi/6$
E $\pi/2$

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We have $\sin(\pi/3) = \sqrt{3}/2$.

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Question 3.

Find the exact value of $tan(sin^{-1}(-5/13))$.

- A 5/12
- **B** 12/5
- C 12/5
- D -5/12
- E 12/13

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Let $t = \sin^{-1}(-5/13)$. Since $\sin(t) = -5/13$ and $-\pi/2 \le t \le 0$, we have $\cos(t) = +\sqrt{1 - (-5/13)^2} = 12/13$ from the Pythagorean identity. Note that we know $\cos(t) > 0$ since *t* is in the fourth quadrant. Thus $\tan(t) = \sin(t)/\cos(t) = -5/12$. This one could also be done on the calculator.

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Question 4.

Consider the two statements: A. $sin^{-1}(sin(5)) = 5$ B. $sin(sin^{-1}(1/3)) = 1/3$. Which are true?

- A A and B
- B Only A
- C Only B
- D Neither A nor B.
- E All of the above.

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We can check on the calculator that the first is false and the second is true. The statement A fails since 5 is not in the restricted domain used to find \sin^{-1} .