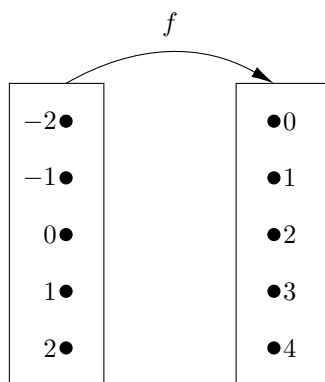


**Learning Outcomes:** What should you be able to after watching the videos?

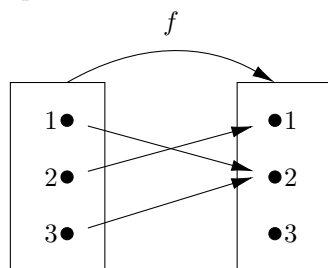
- Video 1: General Inverse Functions
  - Draw an arrow diagram to represent a function and its inverse.
  - Sketch the graph of the inverse of a function by reflecting it across the  $y = x$  line.
- Video 2: Inverse Trigonometric Functions
  - State the domain and range of the inverse sine, inverse cosine, and inverse tangent functions.
  - Evaluate the inverse sine, inverse cosine, and inverse tangent functions on special values.
  - Identify the graphs of the inverse sine, inverse cosine, and inverse tangent functions.
- Video 3: Geometric Interpretations of Inverse Trigonometric Functions
  - Draw a triangle with an angle corresponding to a specific inverse trigonometric function.
  - Evaluate compositions of trigonometric functions and inverse trigonometric functions using triangles.

#1) Draw the arrows to represent the function  $f(x) = x^2$  in the arrow diagram below.



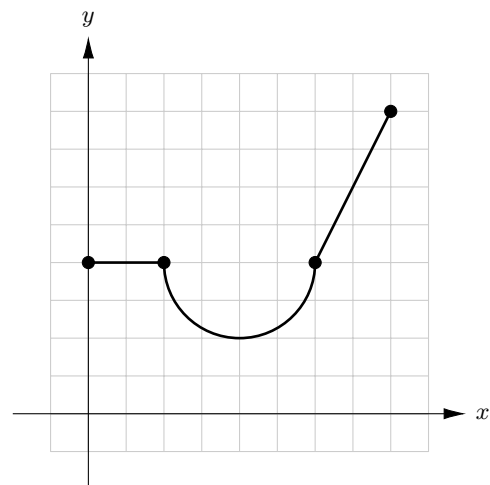
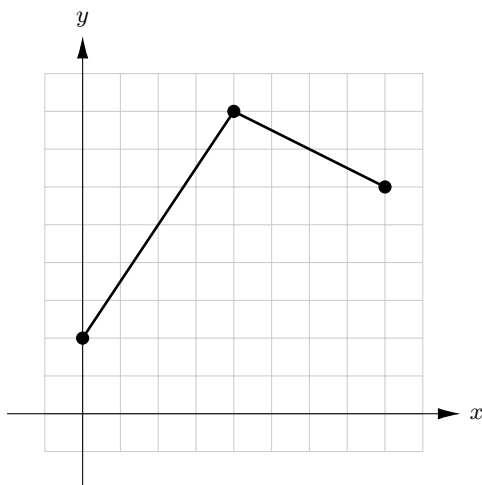
#2) In the diagram above, you should not have drawn an arrow pointing to the number 3. Does this mean that there is no number  $x$  such that  $x^2 = 3$ ? Explain your answer.

#3) A function  $f$  has been defined by the arrow diagram below. Draw an arrow diagram for the inverse  $f^{-1}$ . For this problem, assume that the drawing is a complete representation.



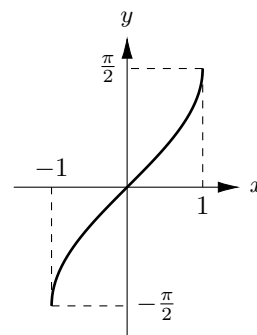
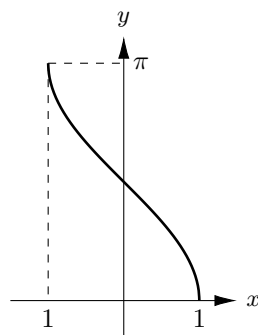
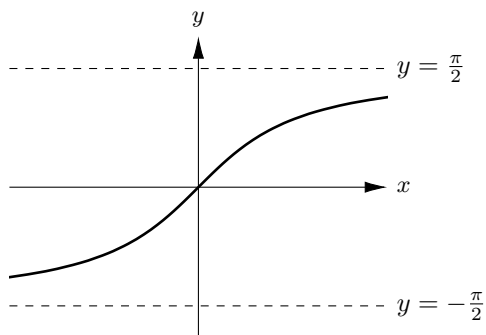
#4) In the previous problem, is  $f^{-1}$  a function? Explain your reasoning.

#5) Two functions have been drawn in the diagram below. Sketch the inverses on the same coordinate axes.



#6) Do the inverse graphs for the problem above represent functions? Explain your reasoning.

#7) Identify each graph below as the inverse sine, inverse cosine, or inverse tangent function. Then state the domain and range of the function.



#8) Complete the following charts of values for the inverse trigonometric functions. (Note: The  $x$  values have been listed in increasing order.)

$x$	$-1$	$-\frac{\sqrt{3}}{2}$	$-\frac{\sqrt{2}}{2}$	$-\frac{1}{2}$	$0$	$\frac{1}{2}$	$\frac{\sqrt{2}}{2}$	$\frac{\sqrt{3}}{2}$	$1$
$\sin^{-1}(x)$									

$x$	$-1$	$-\frac{\sqrt{3}}{2}$	$-\frac{\sqrt{2}}{2}$	$-\frac{1}{2}$	$0$	$\frac{1}{2}$	$\frac{\sqrt{2}}{2}$	$\frac{\sqrt{3}}{2}$	$1$
$\cos^{-1}(x)$									

$x$	$-\sqrt{3}$	$-1$	$-\frac{1}{\sqrt{3}}$	$0$	$\frac{1}{\sqrt{3}}$	$1$	$\sqrt{3}$
$\tan^{-1}(x)$							

#9) For each inverse trigonometric function, draw a triangle that can be used to represent the angle.

$$\cos^{-1}\left(\frac{3}{5}\right)$$

$$\tan^{-1}\left(\frac{4}{9}\right)$$

**#10)** Compute  $\tan(\sin^{-1}(\frac{5}{7}))$ . Show your work in an organized manner.

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Was any aspect of any of the videos confusing or unclear? Do you have any questions?