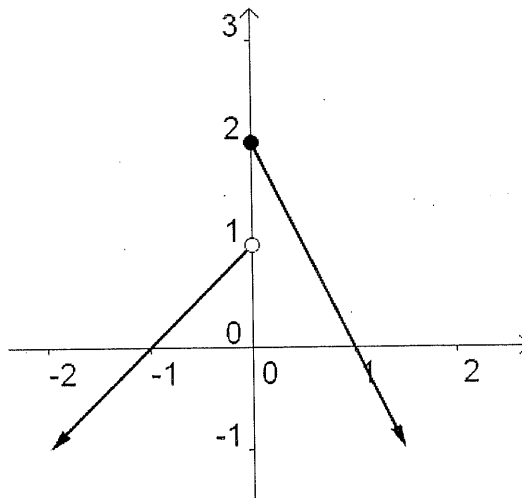


Some questions written with the aid of Geogebra.

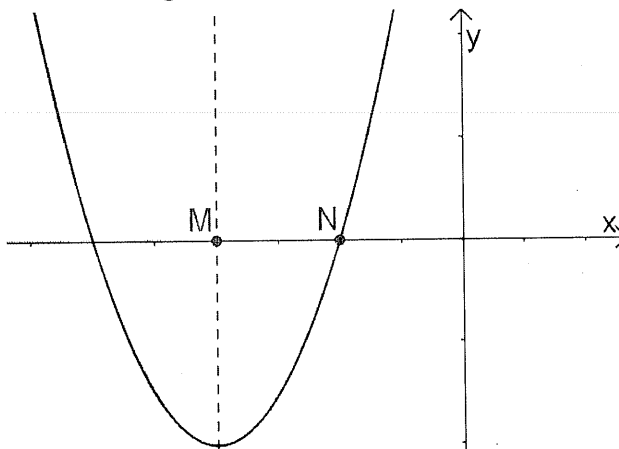
21. Which function is represented by the graph shown?

- A.  $f(x) = \begin{cases} x+1, & \text{if } x \leq 0 \\ 2x+2, & \text{if } x > 0 \end{cases}$
- B.  $f(x) = \begin{cases} -x+1, & \text{if } x \leq 0 \\ \frac{1}{2}x+3, & \text{if } x > 0 \end{cases}$
- C.  $f(x) = \begin{cases} x+1, & \text{if } x \leq 0 \\ -\frac{1}{2}x+2, & \text{if } x > 0 \end{cases}$
- D.  $f(x) = \begin{cases} -x+1, & \text{if } x \leq 0 \\ -2x+2, & \text{if } x > 0 \end{cases}$



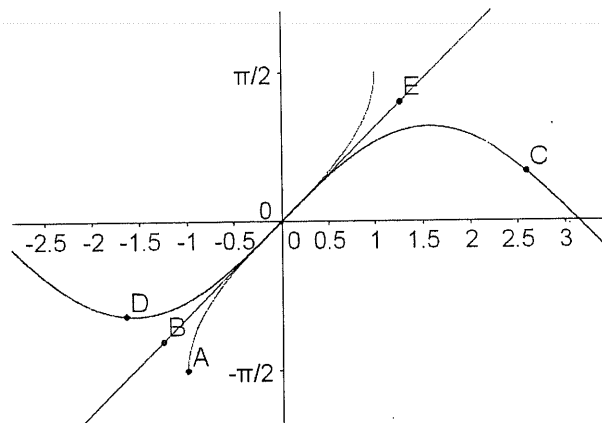
11. Consider the parabola whose graph is shown at the right. Notice points M and N. Suppose the parabola is the graph of the equation  $y = ax^2 + bx + c$ . Which expression gives the distance from point M to point N?

- A.  $\frac{b}{a}$
- B.  $\frac{b^2}{4ac}$
- C.  $(\frac{-b}{2a}, 0)$
- D.  $\frac{\sqrt{b^2 - 4ac}}{2a}$
- E.  $\frac{-b}{2a}$



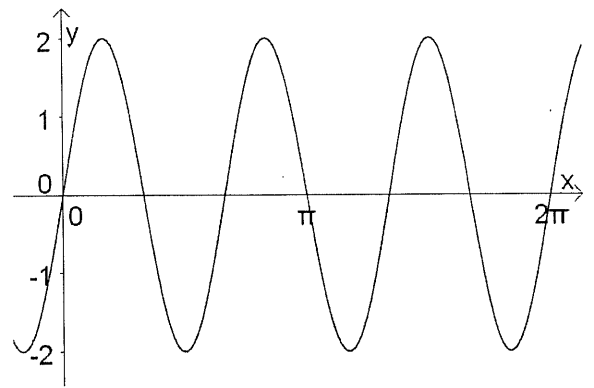
Part 1: Multiple Choice. Place the best choice in the blank on the separate answer sheet.

1. Consider the family of graphs shown at the right. Which point is plotted on the graph of  $y = \sin^{-1}(x)$ ?  
 A. A    B. B and E    C. C    D. D    E. D and C
2. Consider point E within the graph plotted at the right. Which gives the most likely equation for the function which contains point E?  
 A.  $y = \sin(x)$     B.  $y = \cos(x)$     C.  $y = 2x$   
 D.  $y = \sin^{-1}(x)$     E.  $y = x$



4. Consider the graph shown at the right: The period of the graph shown is:

- A.  $2\pi$    B.  $\frac{\pi}{4}$    C.  $\frac{2\pi}{3}$    D.  $\frac{\pi}{3}$    E.  $\frac{\pi}{2}$



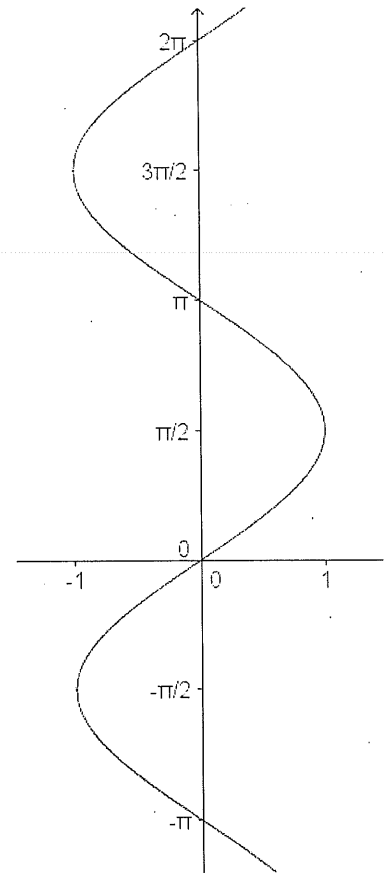
5. In the equation  $y = A \sin B(x + C) + D$  what value of B would give the same period as the graph shown at the right?

- A. 2   B. 3   C. 4   D. 5   E. 6

*Use for questions 4 and 5*

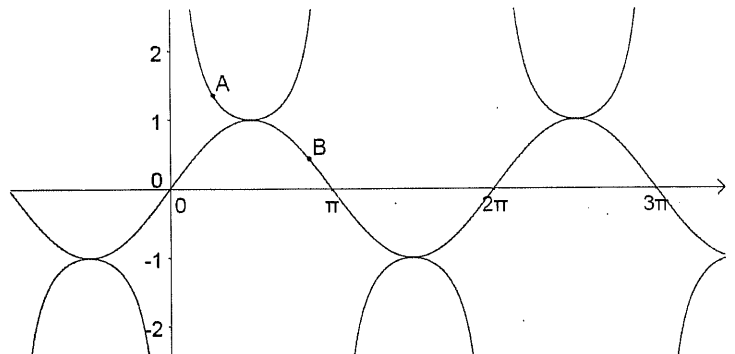
7. The graph of the inverse relation for the sine function is shown at the right. This is the graph we drew on graph paper in pencil and folded along a certain reflection line and then traced to produce a graph of the inverse relation. To form a function we restricted the range of the inverse relation until it would pass the vertical line test. Which of the following gives the range of the function  $y = \sin^{-1}(x)$ .

- A.  $-1 \leq y \leq 1$   
 B.  $\frac{\pi}{2} \leq y \leq \frac{3\pi}{2}$   
 C.  $0 \leq y \leq \pi$   
 D.  $\frac{3\pi}{2} \leq y \leq \frac{5\pi}{2}$   
 E.  $-\frac{\pi}{2} \leq y \leq \frac{\pi}{2}$



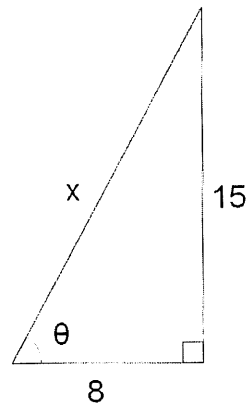
8. Locate the points A and B on the graphs plotted at the right. The statement which best describes the two functions which contain points A and B is that they are?

- A. reciprocals  
 B. inverse functions



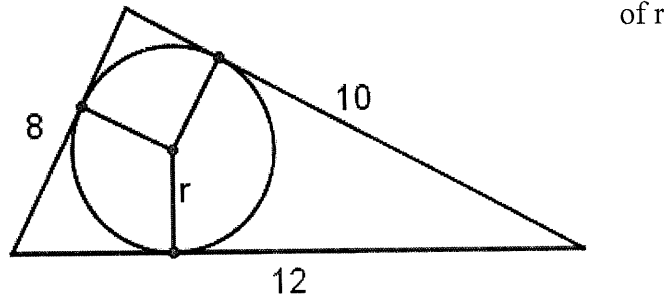
9. In the triangle shown at the right, find  $\cos(\theta)$

- A.  $\frac{15}{8}$    B.  $\frac{15}{17}$    C.  $\frac{8}{15}$    D.  $\frac{15}{17}$    E.  $\frac{8}{17}$



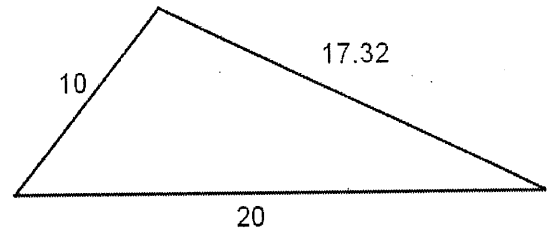
31. Compute the length

- A.  $\sqrt{7}$   
 B. 4  
 C.  $\sqrt{15}$   
 D. 6.5  
 E.  $3\sqrt{3}$

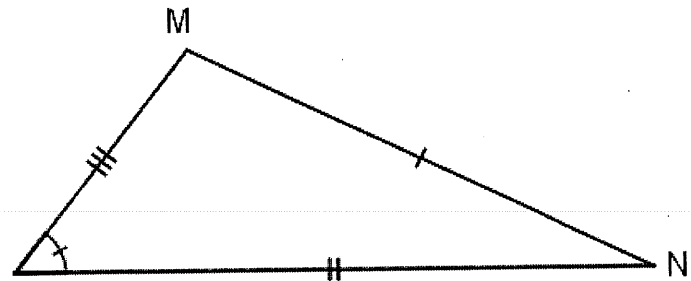


23. Compute the area of the triangle shown at the right:

- A. 56.6   B. 66.6   C. 76.6   D. 86.6   E. 96.6



6. Suppose we're solving a triangle and part way through the process we have found the parts marked in the triangle shown at the right. Which is the best way to proceed. You may make the assumption that the triangle is drawn reasonably to scale.



- A. find either M or N next, it doesn't matter  
 B. find M next, using the law of sines, and then find N  
 C. find N next, using the law of sines, and then find M  
 D. use law of cosines to find M or N, and then find the other.