

1.3 #41 Express  $\sin(3\pi/2 - x)$  in terms of  $\sin x$  and  $\cos x$ .

Solution

From the sum and difference formulas  
 $\sin(A \pm B) = \sin A \cos B \pm \cos A \sin B$ ,  
with  $A = 3\pi/2$  and  $B = -x$ , we have

$$\begin{aligned}\sin(3\pi/2 - x) &= \sin(3\pi/2) \cos x - \cos(3\pi/2) \sin x \\ &= (-1) \cos x - (0) \sin x \quad \text{since } \sin(3\pi/2) = -1 \\ &\quad \text{and } \cos(3\pi/2) = 0 \\ &= \boxed{-\cos x} \quad \square\end{aligned}$$