

# Math 1613 - Trigonometry

Quiz #17 - 2018.10.24

Solutions

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In class, we derived the identity  $\sin(A + B) = \sin(A)\cos(B) + \cos(A)\sin(B)$ . Given that  $\cos(s) = -\frac{15}{17}$ ,  $\sin(t) = \frac{4}{5}$ , where  $s$  and  $t$  are angles in quadrants II and I, respectively, use this information to determine  $\sin(s + t)$ . (Hint:  $15^2 + 8^2 = 17^2$  and  $4^2 + 3^2 = 5^2$ .)

Since  $s$  is in quadrant II,  $\sin(s) = \frac{8}{17} > 0$ . Similarly, since  $t$  is in quadrant I,  $\cos(t) = \frac{3}{5} > 0$ . Using the  $\sin(A + B)$  identity with what we are given and have computed:

$$\begin{aligned}\sin(s + t) &= \sin(s)\cos(t) + \cos(s)\sin(t) \\ &= \frac{8}{17} \cdot \frac{3}{5} + \frac{-15}{17} \cdot \frac{4}{5} \\ &= \frac{24 - 60}{85} \\ &= -\frac{36}{85}\end{aligned}$$