60. $\cos t = -\frac{4}{5}$ and $t$ lies in quadrant III, so the terminal point determined by $t$ is $P\left(-\frac{4}{5}, y\right)$. Since $P$ is on the unit circle $\left(-\frac{4}{5}\right)^2 + y^2 = 1$. Solving for $y$ gives $x = \pm\sqrt{1 - \frac{16}{25}} = \pm\sqrt{\frac{9}{25}} = \pm\frac{3}{5}$. Since $t$ is in quadrant III, $y = -\frac{3}{5}$. Thus the terminal point is $P\left(-\frac{4}{5}, -\frac{3}{5}\right)$. Thus, $\sin t = -\frac{3}{5}$, $\tan t = \frac{3}{4}$, $\csc t = -\frac{5}{3}$, $\sec t = -\frac{5}{4}$, $\cot t = \frac{4}{3}$.

62. $\sec t = 3$ and $t$ lies in quadrant IV. Thus, $\cos t = \frac{1}{3}$ and the terminal point determined by $t$ is $P\left(\frac{1}{3}, y\right)$. Since $P$ is on the unit circle $\left(\frac{1}{3}\right)^2 + y^2 = 1$. Solving for $y$ gives $y = \pm\sqrt{1 - \frac{1}{9}}$ $= \pm\sqrt{\frac{8}{9}} = \pm\frac{2\sqrt{2}}{3}$. Since $t$ is in quadrant IV, $y = -\frac{2\sqrt{2}}{3}$. Thus the terminal point is $P\left(\frac{1}{3}, -\frac{2\sqrt{2}}{3}\right)$. Therefore, $\sin t = -\frac{2\sqrt{2}}{3}$, $\cos t = \frac{1}{3}$, $\tan t = -2\sqrt{2}$, $\csc t = -\frac{3}{2\sqrt{2}}$, $\cot t = -\frac{1}{2\sqrt{2}}$.

64. $\tan t = \frac{1}{4}$ and $t$ lies in quadrant III. Since $\sec^2 t = \tan^2 t + 1$ we have $\sec^2 t = \left(\frac{1}{4}\right)^2 + 1 = \frac{1}{16} + 1$ $= \frac{17}{16}$. Thus $\sec t = \pm\sqrt{\frac{17}{16}} = \pm\frac{\sqrt{17}}{4}$. Since $\sec t < 0$ in quadrant III we have $\sec t = -\frac{\sqrt{17}}{4}$, so $\cos t = \dfrac{1}{\sec t} = \dfrac{1}{-\frac{\sqrt{17}}{4}} = -\frac{4}{\sqrt{17}} = -\frac{4\sqrt{17}}{17}$. Since $\tan t \cdot \cos t = \sin t$ we have $\sin t = \left(\frac{1}{4}\right)\left(-\frac{4}{\sqrt{17}}\right)$ $= -\frac{1}{\sqrt{17}} = -\frac{\sqrt{17}}{17}$. Thus, the terminal point determined by $t$ is $P\left(-\frac{4\sqrt{17}}{17}, -\frac{\sqrt{17}}{17}\right)$. Therefore, $\sin t = -\frac{\sqrt{17}}{17}$, $\cos t = -\frac{4\sqrt{17}}{17}$, $\csc t = -\sqrt{17}$, $\sec t = -\frac{\sqrt{17}}{4}$, $\cot t = 4$.

66. $\tan t = -4$ and $t$ lies in quadrant II. Since $\sec^2 t = \tan^2 t + 1$ we have $\sec^2 t = (-4)^2 + 1 = 16 + 1$ $= 17$. Thus $\sec t = \pm\sqrt{17}$. Since $\sec t < 0$, we have $\sec t = -\sqrt{17}$ and $\cos t = \dfrac{1}{\sec t} = \frac{1}{-\sqrt{17}}$ $= -\frac{\sqrt{17}}{17}$. Since $\tan t \cdot \cos t = \sin t$ we have $\sin t = (-4)\left(-\frac{\sqrt{17}}{17}\right) = \frac{4\sqrt{17}}{17}$. Thus, the terminal point determined by $t$ is $P\left(-\frac{\sqrt{17}}{17}, \frac{4\sqrt{17}}{17}\right)$. Thus, $\sin t = \frac{4\sqrt{17}}{17}$, $\cos t = -\frac{\sqrt{17}}{17}$, $\csc t = \frac{\sqrt{17}}{4}$, $\sec t = -\sqrt{17}$, $\cot t = -\frac{1}{4}$.