3 Use Sum and Difference Formulas Involving Inverse Trigonometric Functions

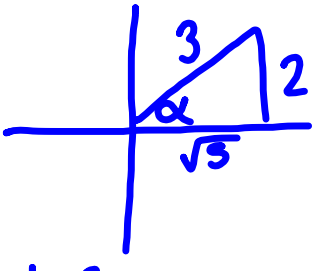
EXAMPLE

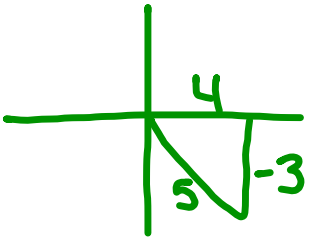
Finding the Exact Value of an Expression Involving Inverse Trigonometric Functions

Find the exact value of: $\cos\left(\sin^{-1}\frac{2}{3}+\tan^{-1}\left(-\frac{3}{4}\right)\right)=\cos(\alpha+\beta)$

α β

$\sin\alpha=\frac{2}{3}, 0\le\alpha\le\frac{\pi}{2}$ $\quad\tan\beta=-\frac{3}{4}, -\frac{\pi}{2}\le\beta\le 0$





$\sin^{-1}=\frac{2}{3}$

$\sin\alpha=\frac{2}{3}$

$\cos(\alpha+\beta)=\cos\alpha\cos\beta-\sin\alpha\sin\beta$

$\frac{\sqrt{5}}{3}\cdot\frac{4}{5}-\frac{2}{3}\cdot\frac{-3}{5}$

$\frac{4\sqrt{5}+6}{15}$