What is the $y$-intercept of the line passing through the points $(-3, 9)$ and $(8, -2)$?

Solution. The slope is given by

$$m = \frac{-2 - 9}{8 - (-3)} = \frac{-11}{11} = -1.$$ 

Thus an equation for the line is (in point-slope form) $y + 2 = -1(x - 8)$. In slope-intercept form this is $y = -x + 6$, so the $y$-intercept is 6.