8. Given the function $w(e)=e^2+2e$,
find an equation of the secant line containing $(3,w(3))$
and $(5,w(5))$. Express the equation in slope-intercept form.

$x = -45 + 10e$

$x = 45 - 10e$

$x = -15 + 10e$

$x = -14 + \frac{21e}{2}$

Solution

The line passing through the two points has the slope:

$$\frac{w(5)-w(3)}{5-3}$$
$$= \frac{(1(5)^2+2(5))-(1(3)^2+2(3))}{2}$$
$$= \frac{35-15}{2}$$
$$= 10$$

using one of the points, say $(3,15)$ and the slope to get the equation of the secant line:

$x-15 = 10(e-3)$

The equation in slope-intercep form:

$x = -15 + 10e$