Quiz 4

Find the general solution of $y'' + 4y = 3\sin(2t)$

- Sol'n to homogeneous $y'' + 4y = 0 \rightsquigarrow r^2 + 4 = 0$

$$r = \pm 2i$$

So $y_1 = \cos(2t)$, $y_2 = \sin(2t)$

- $3\sin(2t)$ is a sol'n to homogeneous part ("common root") So need to guess

$$Y = At\sin(2t) + Bt\cos(2t)$$

$$Y' = A\sin(2t) + 2At\cos(2t) + B\cos(2t) - 2Bt\sin(2t)$$

$$Y'' = 2A\cos(2t) + 2A\cos(2t) - 4At\sin(2t)$$
$$- 2B\sin(2t) - 2B\sin(2t) - 4Bt\cos(2t)$$

	$\sin(2t)$	$\cos(2t)$
Y''	$-4B$	$+4A$
$4Y$	0	0
	3	0

$A = 0$

$B = -\frac{3}{4}$

So $Y = -\frac{3}{4}t\cos(2t)$

- General Sol'n is $\quad Y(t) = -\frac{3}{4}t\cos(2t) + C_1\cos(2t) + C_2\sin(2t)$