

For each of the differential equations on the left, identify which functions on the right are solutions. There may be none, and there may be more than one!

$$\boxed{1} \quad y'' = 9y$$

$$(a) \quad y = 3$$

$$\boxed{2} \quad y'' = -9y$$

$$(b) \quad y = 3 \cos(x)$$

$$\boxed{3} \quad y' = 3y$$

$$(c) \quad y = \cos(3x)$$

$$\boxed{4} \quad y' = -3y$$

$$\boxed{5} \quad y'' = 3y'$$

$$(d) \quad y = \sin(3x)$$

$$\boxed{6} \quad y' = 3\frac{y}{x} \quad \text{or} \quad xy' - 3y = 0$$

$$(e) \quad y = e^{3x}$$

$$\boxed{7} \quad xy' - y = 2x^3$$

$$(f) \quad y = e^{-3x}$$

$$\boxed{8} \quad y'' = 2y'$$

$$(g) \quad y = x^3$$

By equation: 1 (e), (f) 2 (c), (d) 3 (e) 4 (f) 5 (a), (e) 6 (g) 7 (g) 8 (a)**By solution:**(a) 5 and 8

(b) None

(c) 2(d) 2(e) 1 and 3 and 5(f) 1 and 4(g) 6 and 7