

Name: _____

Quiz 10, Section 4.7, due on ~~Wed~~ Tue 9 Jul(10 pts) Solve the initial value problem $x^2 y'' - 6xy' + 12y = 0$, $y(2) = 40$, $y'(2) = 0$.

$$m(m-1) - 6m + 12 = 0$$

$$m^2 - 7m + 12 = 0$$

$$(m-3)(m-4) = 0$$

$$m = 3, 4$$

$$y = c_1 x^3 + c_2 x^4$$

$$y' = 3c_1 x^2 + 4c_2 x^3$$

$$40 = y(2) = 8c_1 + 16c_2$$

$$0 = y'(2) = 12c_1 + 32c_2$$



$$80 = 16c_1 + 32c_2$$

$$0 = 12c_1 + 32c_2$$

subtract

$$80 = 4c_1$$

$$c_1 = 20$$

$$\text{so } 40 = \frac{160}{16} + 16c_2$$

$$-\frac{120}{16} = c_2$$

$$= -\frac{15}{2}$$

$$y(x) = 20x^3 - \frac{15}{2}x^4$$