4)a) Euler's $t = 2.75, 3.0, 3.25$ $h = 0.25$

$\frac{dy}{dt} = 2y^2(3-t)$, $y(2.5) = 3 \leftrightarrow y_0 = 3$

$t_0 = 2.5$

$\tilde{y}_1 = y_0 + h\left(\frac{dy}{dt}\right)$; $y_1 = 3 + 0.25\,(2(3)^2(3-2.5))$

$= 21/4 = 5.25$

$t_1 = 2.75$

$\tilde{y}_2 = 5.25 + 0.25(2(5.25)^2(3-2.75)) = 1113/128$

$= 8.6953125$

$t_2 = 3$

$\tilde{y}_3 = 8.6953125 + 0.25(2(8.6953125)^2(0)) =$

8.6953125

$t_3 = 3.25$

4)b) $t_0 = 2.5$ $y_0 = 3$

$a = f(2.5, 3) = 2(3)^2(3-2.5) = 9$

$b = 3 + 0.25(a) = 5.25$

$c = f(2.75, 5.25) = 2(5.25)^2(3-2.75) = 13.78125$

$\tilde{y}_1 = 3 + \frac{0.25}{2}(a + c) = 3 + \frac{0.25}{2}(9 + 13.78125)$

$= 5.84765625$ $t_1 = 2.75$

$a = f(2.75, 5.84765625) = 2(5.84765625)^2$

$(3-2.75)$

$= 17.09754181$

$b = 5.84765625 + 0.25(a) = 10.1220417$

$c = f(3, 10.1220417) = 2(10.1220417)^2(3-3) = 0$

$\tilde{y}_2 = 5.84765625 + \frac{0.25}{2}(a + c)$

$\tilde{y}_2 = 5.84765625 + \frac{0.25}{2}(17.09754181)$

$= 7.9848848976 \qquad t_2 = 3$

$a = f(3, 7.9848848976) = 2(7.9848848976)^2(3-3)$

$= 0$

$b = 7.9848848976 + 0.25(0) = 7.9848848976$

$c = f(3.25, 7.9848848976) = 2(7.9848848976)^2(3-3.25)$

$= -31.87890658$

$\tilde{y}_3 = 7.9848848976 + \frac{0.25}{2}(a+c)$

$= 7.9848848976 + \frac{0.25}{2}(-31.87890658)$

$= 3.9999985654 \qquad t_3 = 3.25$