

tuesday, 24 november:

course evaluations

§ 9.3 - separable equations

 \S 9.4 - exponential growth and decay

thursday, 26 november:

no school (thanksgiving)

tuesday, I december:

review for final quiz v: §§ 9.1, 9.3

thursday, 3 december:

review for final homework viii due: 9.1.4, 9.1.12, 9.3.12, 9.3.36, 9.4.4, 9.4.14.

friday, 4 december:

mslc: webwork workshop @ 12:30, 1:30, 2:30, 3:30, 4:30 in SEL 040 webwork homework vii due @ 11:55 pm

monday, 7 december:

extra credit project 3 due @ 6 am mslc: final exam review @ 7:30 pm in HI 131

tuesday, 8 december:

final exam @ 5:30 pm

separable equations

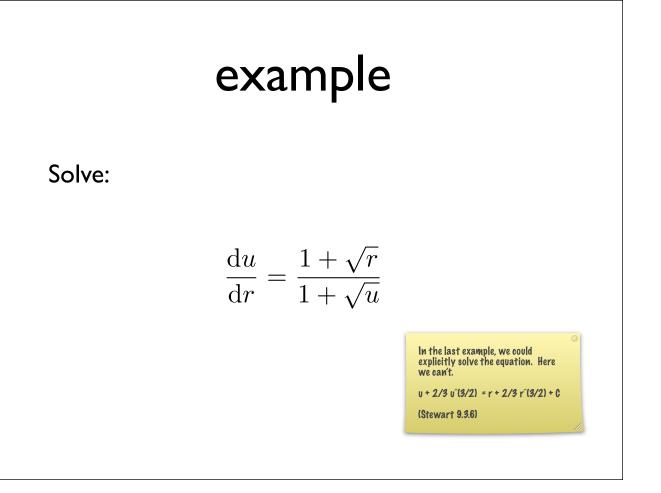
A separable equation is a first-order differential equation in which the expression for dy/dx can be factored as a function of x times a function of y. In other words, it can be written in the form

$$\frac{\mathrm{d}y}{\mathrm{d}x} = f(x)\,g(y)$$

This definition is verbatim from Stewart's section 9.3.

Solve by multiplying both sides by dx, dividing by g(y) and integrating.

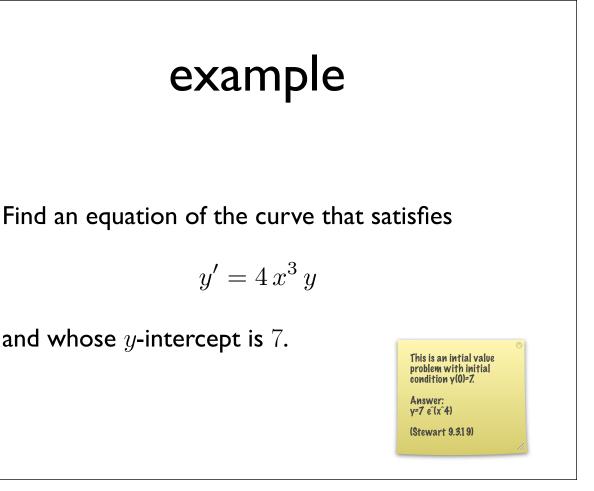
Solve: $\frac{dz}{dt} + e^{t+z} = 0$ Split up e'(1+z), separate. Answer: $z = -\ln (e^{t} - c)$ (Stewart 9.510)



initial value problems

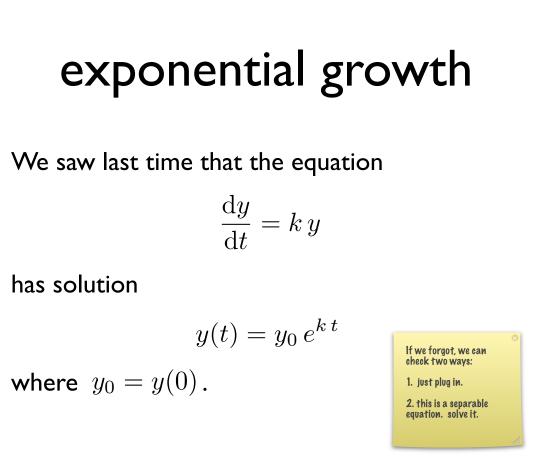
An initial value problem is an ordinary differential equation together with a specified value, called an initial condition, of the unknown function at a given point in the domain of the solution.



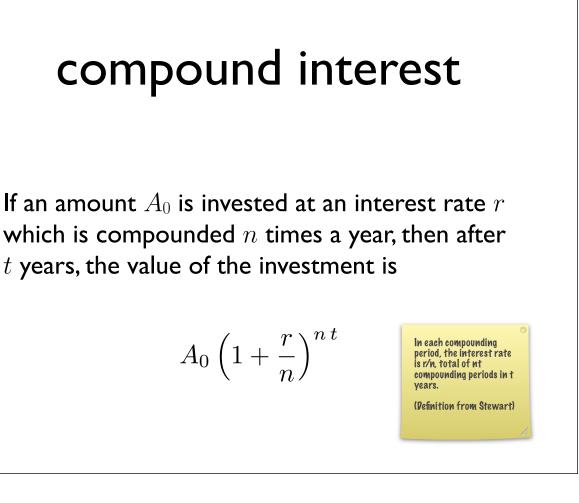


EXAMPLE 1 Subscription of the second seco

if k < 0, we call this the law of natural decay.



Lacrange Particular a series of about 5730 years. A piece of parchment was discovered that had about 74% as much ¹⁴C radioactivity as does plant material today. Estimate the age of the parchment.



compound interest

Letting $n \to \infty$ we arrive at the formula for continuously compounded interest:

$$\lim_{n \to \infty} A_0 \left(1 + \frac{r}{n} \right)^{nt} = \lim_{n \to \infty} A_0 \left[\left(1 + \frac{r}{n} \right)^{n/r} \right]^{rt}$$

$$= A_0 \left[\lim_{n \to \infty} \left(1 + \frac{r}{n} \right)^{n/r} \right]^{rt}$$

$$= A_0 \left[\lim_{m \to \infty} \left(1 + \frac{1}{m} \right)^m \right]^{rt}$$

$$= A_0 e^{rt}$$

example

How long will it take an investment to double in value if the interest rate is 6% compounded continuously?



coming soon

- quiz v (§§ 9.1, 9.3) next tuesday
- extra credit project 3 due on 7 december