scoring guidelines 2014AB6 (DEQ)

(a) 1 : solution curve

(b) 2 : { 1 : tangent line equation; 1 : approximation }

(c) 6 : { 1 : separation of variables; 2 : antiderivatives; 1 : constant of integration; 1 : uses initial condition; 1 : solves for y }

Note: max 3/6 [1-2-0-0-0] if no constant of integration

Note: 0/6 if no separation of variables

note: $\int \frac{du}{u} =$

$\ln|u| =$

$|u| =$ something

$u = \pm$ something

then check I.C. again

#1 - calculator OK

2013 AB 1 (gravel plant)

Notes: Rate of change of amount of unprocessed gravel:

$G(t) - 100$ tons/hr.

(b) FTC(2)

(c) what needs to be + or − for This one

(d) global max question

⟹ check end points and critical points

#27 p. 481

#21 $\sum_{n=0}^{\infty} 2^n x^n$ conv. interval $-\frac{1}{2} < x < \frac{1}{2}$

$\rightarrow f(x) = \frac{1}{1-2x}$

use series to find a power series for $f'(x)$

series: $2^0 x^0 + 2^1 x^1 + 2^2 x^2 + 2^3 x^3 + \cdots$

$f'(x)$ will be convergent on $-\frac{1}{2} < x < \frac{1}{2}$

deriv. of series: $1 \cdot 2^1 x^0 + 2 \cdot 2^2 \cdot x^1 + 3 \cdot 2^3 \cdot x^2 + 4 \cdot 2^4 \cdot x^3 + \cdots$

n: 1 2 3 4

general term: $n \cdot 2^n x^{n-1}$

series for $f'(x) = \sum_{n=1}^{\infty} n \cdot 2^n \cdot x^{n-1}$

n: 0 1 2 3...

series $\sum_{n=0}^{\infty} (n+1) \cdot 2^{n+1} \cdot x^n$ ok!

$$f'(x) = \frac{-(-2)}{(1-2x)^2} = \frac{2}{(1-2x)^2}$$

#31 Find power series for

$$\int_0^x f(t)\,dt \qquad f(t) = \frac{1}{1-2x}$$

series: $2^0x^0 + 2^1x^1 + 2^2x^2 + 2^3x^3 + 2^4x^4 + \cdots$

series for $\int_0^x f(t)\,dt$: $\frac{2^0x^1}{1} + \frac{2^1x^2}{2} + \frac{2^2x^3}{3} + \frac{2^3x^4}{4} + \frac{2^4x^5}{5} + \cdots$

n: 1 2 3 4 5 ...

series for $= \sum_{n=1}^{\infty} \frac{2^{n-1}x^n}{n} \qquad -\frac{1}{2} < x < \frac{1}{2}$

fcn $-\frac{1}{2}\int \frac{1}{1-2x}(-2dx) = -\frac{1}{2}\ln(1-2x)$