Panel 1

Find the following integrals:

a) $\int 3x^8 + 6e^x + \frac{7}{x} - \frac{8}{x^3} - 4\sqrt[3]{x^2}\,dx$

$3\cdot\frac{1}{9}x^9 + 6e^x + 7\cdot\ln|x| - 8\left(-\frac{1}{2}\right)x^{-2} - 4\cdot\frac{3}{5}x^{5/3} + C$

b) $\int_1^e (x^2 - \frac{1}{x})dx = \frac{1}{3}x^3 - \ln|x|\Big|_1^e = \left[\frac{1}{3}e^3 - \ln|e|\right] - \left[\frac{1}{3}(1)^3 - \ln|1|\right]$

$= \frac{1}{3}e^3 - 1 - \frac{1}{3} + 0$

1

Panel 2

$y = 2x - x^2 + 8$ from $x = -2$ to 1 $\quad -x^2 + 2x + 8$

$A = \int_{-2}^{1} 2x - x^2 + 8\,dx =$

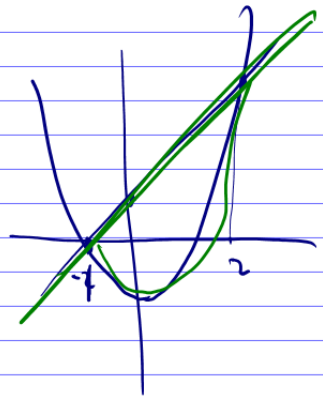
$x^2 - \frac{1}{3}x^3 + 8x\Big|_{-2}^{1} =$

Find the area between $f(x) = x^2 - 1$ and $g(x) = x + 1$. Make sure to **sketch the functions and shade** the region whose area you are looking for).

2

Panel 3

Find the area between $f(x) = x^2 - 1$ and $g(x) = x + 1$. Make sure to **sketch the functions and shade the region whose area you are looking for).**



$x^2 - 1 = x + 1$

$x^2 - x - 2 = 0$

$(x-2)(x+1)$

$$\int_{-1}^{2} (x+1) - (x^2-1)\,dx = \int_{-1}^{2} x + 2 - x^2\,dx = 9/2$$

$=$

3

Panel 4

$f(x)$ if $f'(x) = \sqrt{x} - 3$ and $f(4) = -1$.

$x^{1/2}$

$$f(x) = \int \sqrt{x} - 3\,dx$$

$$f(x) = \frac{2}{3}x^{3/2} - 3x + C$$

$\int_{-1}^{2} 10x^4 - x\,dx$

$$f(4) = \frac{2}{3}(4)^{3/2} - 3\cdot 4 + C = -1$$

$$\frac{2}{3}\cdot 8 - 12 + C = -1$$

$$\frac{16}{3} - 12 + C = -1$$

$$C = -1 + 12 - \frac{16}{3}$$

4

Panel 5

$\int_{-1}^{2} 10x^4 - x\,dx$ $= 10 \cdot \frac{1}{5}x^5 - \frac{1}{2}x^2 \Big|_{-1}^{2} = \frac{129}{2}$

5

Panel 6

Financial Math

$S = P(1+r)^n$ compound interest

$S = Pe^{rt}$ cont. compounding

$= PV$ value now of \$X in the future

$= FV$ value of \$X in the future.

$r_e = 1 - (1+r)^n$ effective rate

6

Panel 7

If $A = P(1+r)^n$

$100 = 100\left(1 + \frac{0.06}{12}\right)^{12 \cdot t}$

$10 = 1.005^{12 \cdot t}$ | $\ln(\,)$

$\ln(10) = \ln\left(1.005^{12t}\right) = 12t \ln(1.005)$

$\frac{\ln(10)}{12 \ln(1.005)} = t$

$39.4t = \frac{2.3026}{0.0594} = t$

7