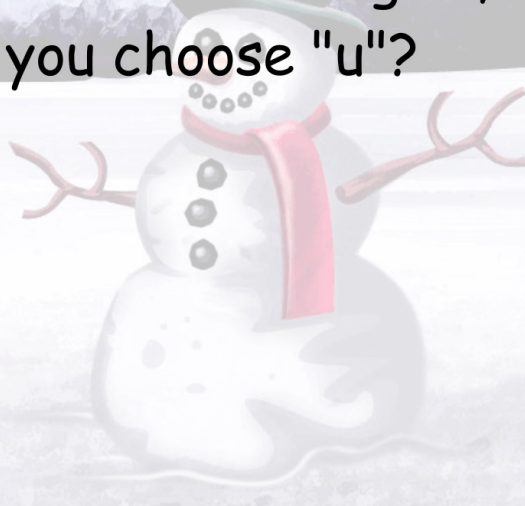


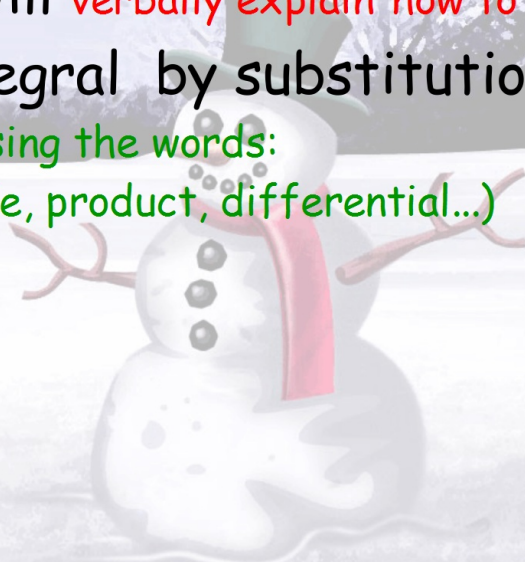
JANUARY 28

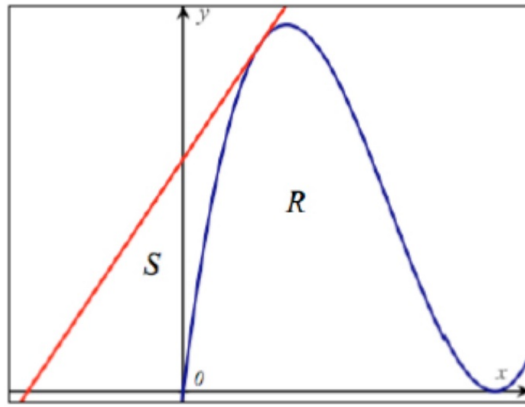
When using the u-substitution method to take the integral, how do you choose "u"?



JANUARY 28

Students will verbally explain how to find the integral by substitution (using the words: inside, outside, product, differential...)





Let f be the function given by $f(x) = x^3 - 16x^2 + 64x$ and let line l be the line tangent to the graph of f at $x = 2$, as shown in the figure above. Let R be the region bounded by the graph of f and the x -axis and let S be the region bounded by the graph of f , the line l , and the x -axis.

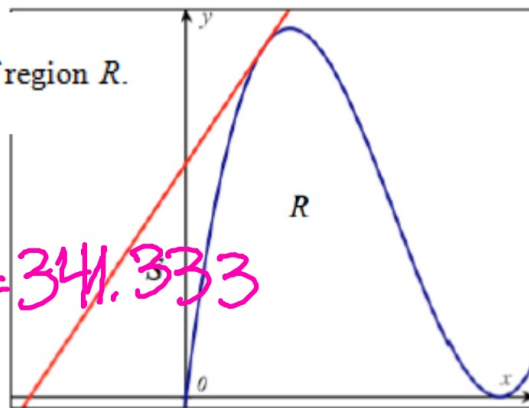
$$f'(x) = 3x^2 - 32x + 64$$

(a) Find the equation of the line l .

$$y - 72 = 12(x - 2) \quad \begin{array}{l} \text{slope} \rightarrow f'(x) \rightarrow f'(2) = 12 \\ \text{point} \rightarrow f(2) = 72 \end{array}$$

(b) Find the area of region R .

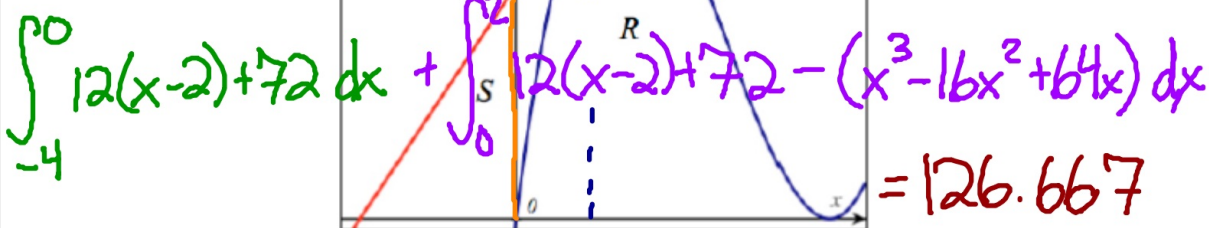
$$\int_0^8 f(x) dx = 341.333$$



Let f be the function given by $f(x) = x^3 - 16x^2 + 64x$ and let line l be the line tangent to the graph of f at $x = 2$, as shown in the figure above. Let R be the region bounded by the graph of f and the x -axis and let S be the region bounded by the graph of f , the line l , and the x -axis.

$$\begin{array}{l} x(x^2 - 16x + 64) \\ x(x - 8)(x - 8) \end{array}$$

(c) Find the area of region S .



Let f be the function given by $f(x) = x^3 - 16x^2 + 64x$ and let line l be the line tangent to the graph of f at $x = 2$, as shown in the figure above. Let R be the region bounded by the graph of f and the x -axis and let S be the region bounded by the graph of f , the line l , and the x -axis.

$$y - 72 = 12(x - 2) \rightarrow y = 12(x - 2) + 72$$

$$\int_{-4}^2 12(x - 2) + 72 \, dx - \int_0^2 f(x) \, dx$$

$$0 = 12(x - 2) + 72$$

(A) $\int (3x - 2)^4 \, dx$

(1) $u =$ _____

(2) $du =$ _____

(3) solve for dx

(4) substitute and simplify

(5) find the integral

(6) substitute u back in

$\int (3x - 2)^4 \, dx =$ _____

Pg 333
#3-72 (multiples of 3)
(skip 15)

#9, 12, 18, 21 → Turn in Thursday