

Name: _____

Quiz 22, section 5.4, Simplify your answers!

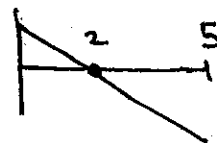
1. (4 pts) Evaluate $\int \frac{4}{9}x^{4/7} - \frac{3}{5}x^{-1/5} dx$

$$= \frac{4}{9} \frac{x^{4/7+1}}{4/7+1} - \frac{3}{5} \frac{x^{-1/5+1}}{-1/5+1} + C$$

$$= \frac{28}{99} x^{11/7} - \frac{3}{4} x^{4/5} + C$$

2. (6 pts) An object travels in a straight line with velocity $v(t) = 6 - 3t$ over the time interval $[0, 5]$. Find the distance the object travelled as well as its net displacement.

$$\begin{aligned} \text{displ} &= \int_0^5 6 - 3t \, dt = 6t - \frac{3}{2}t^2 \Big|_0^5 \\ &= \left(30 - \frac{75}{2}\right) - (0 - 0) \\ &= -\frac{15}{2} \end{aligned}$$



$$\begin{aligned} \text{dist} &= \int_0^5 |6 - 3t| \, dt = \int_0^2 6 - 3t \, dt - \int_2^5 6 - 3t \, dt \\ &= \left(6t - \frac{3}{2}t^2 \Big|_0^2\right) - \left(6t - \frac{3}{2}t^2 \Big|_2^5\right) \\ &= (12 - 6) - \left[\left(30 - \frac{75}{2}\right) - (12 - 6)\right] \\ &= 6 - \left(30 - \frac{75}{2}\right) + 6 \\ &= \frac{75}{2} - 18 \end{aligned}$$