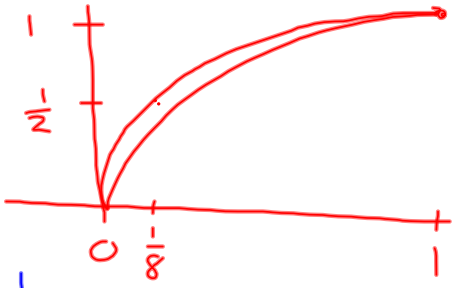
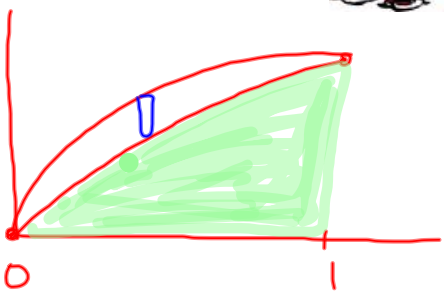
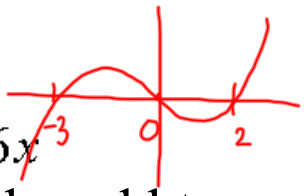
3) Determine the area between $f(x)= x^{\frac{1}{2}}$ and $g(x)= x^{\frac{1}{3}}$ for $0 \le x \le 1$




$$\int_0^1 (x^{\frac{1}{3}} - x^{\frac{1}{2}})\,dx = \int_0^1 x^{\frac{1}{3}}\,dx - \int_0^1 x^{\frac{1}{2}}\,dx = \frac{1}{12}$$

$x(x^2+x-6) = x(x+3)(x-2)$




4) Consider the graph of $f(x) = x^3 + x^2 - 6x$

Determine the total area between the graph and hte x axis between -3 and 2. $\int_{-3}^{2} |f(x)|\,dx$ OR $\int_{-3}^{0} f(x)\,dx + -\int_{0}^{2} f(x)\,dx$

$\int(\text{abs}(x^3+x^2-6x, x, -3, 2))$

Calculus Warm-ups
The Definite Integral

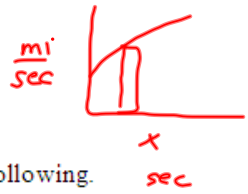
Name_____

1) If f(x) was measured in mi/sec, and x was measured in sec, what would $\int_1^3 f(x)dx$ be measuring?

And what would the units be? Total miles traveled from 1 to 3 seconds.

2) If $f(t) = 32e^{0.05t}$ is the rate (in billions of barrels/yr) of world oil consumption (t=0 is 1990; time is in years), set up an integral which represents the total quantity of oil consumed over 1990-1995.

$\int_0^5 32e^{0.05t}\,dt$




3) ***Without*** calculating, make some predictions (pos, neg, big, small, relative size) about the following.

a) $\int_0^2 x^2 dx$ + , small

b) $\int_{-2}^0 x^3 dx$ −

c) $\int_2^0 x^2 dx$ −

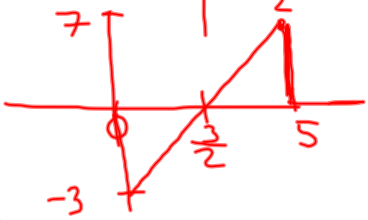
d) $\int_0^{-2} x^3 dx$ +

4) Determine the following

a) $\int_3^9 7dx$ 42


b) $\int_0^2 5xdx$ 10


c) $\int_0^5 2x-3dx$




$\frac{1}{2}\left(5-\frac{3}{2}\right)7-\frac{1}{2}\cdot\frac{3}{2}\cdot 3$

$\frac{1}{2}\cdot\frac{7}{2}\cdot 7-\frac{9}{4}$

$\frac{49}{4}-\frac{9}{4}=10$

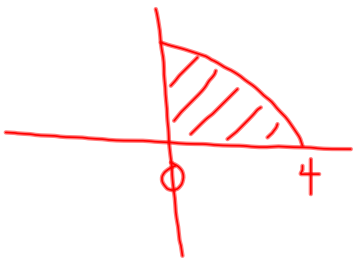
d) $\int_0^4 \sqrt{16-x^2}dx = 4\pi$

5) For a < b and f(x) > 0 over (a,b) say something about a) $\int_a^b f(x)dx$ + b) $\int_b^a f(x)dx$ −

$y=\sqrt{16-x^2}$

$y^2=16-x^2$

$x^2+y^2=16$



Homework is the Definite
Integral worksheet (3 sides)

If absent Thurs, come in at 11:25 Friday to take short homework quiz.