

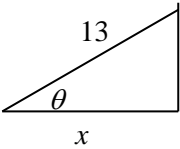
CALCULUS BC
 REVIEW CIRCUIT – REVIEW FOR FINAL

NAME _____
 PERIOD _____ DATE _____

Work problem 1. Find the problem with the answer to problem 1. Number this problem #2. Continue numbering the problems in this fashion.

<p>Answer: $y = -\sqrt{2x^2 + 7}$</p> <p># 1 – Evaluate: $\lim_{x \rightarrow 0} \frac{\sqrt{x+1} - 2}{x-3}$</p>	<p>Answer: $-2\sqrt{3}$</p> <p># ____ - At what value(s) of x does $f(x) = x^4 - 18x^2$ have a relative minimum?</p>
<p>Answer: $-\frac{2}{5}$</p> <p># ____ - Find the derivative, $\frac{dy}{dx}$, of $x^2y - 5y = 12$ and evaluate it at the point $(1, -3)$.</p>	<p>Answer: $\frac{1}{3} \sin(x^3) + C$</p> <p># ____ - Find y' if $y = \ln \frac{\sqrt{4+x^2}}{x}$.</p>
<p>Answer: $(1, 5)$</p> <p># ____ - A particle moves along a horizontal line so that its position is given by $s(t) = t^3 - 9t^2 + 15t + 4$, where $t \geq 0$. When is the particle speeding up?</p>	<p>Answer: $\frac{1}{3}$</p> <p># ____ - Find y' given $y = x^2 \cos x$.</p>

<p>Answer: $-x^2 \sin x + 2x \cos x$</p> <p># ____ - Find $f'(x)$ given $f(x) = \frac{x^2}{\tan x}$.</p>	<p>Answer: 2</p> <p># ____ - Write an equation of the line tangent to the graph of $y = x^3 + 3x^2 + 2$ at its point of inflection.</p>
<p>Answer: (1, 3) and $(5, \infty)$</p> <p># ____ - Evaluate: $\int \sin^3(2x) \cos(2x) dx$</p>	<p>Answer: -3 and 3</p> <p># ____ - Evaluate: $\lim_{h \rightarrow 0} \frac{\sin\left(\frac{\pi}{3} + h\right) - \sin \frac{\pi}{3}}{h}$</p>
<p>Answer: $\frac{5}{2}$</p> <p># ____ - If $f(x) = \cos(4x)$, find $f'\left(\frac{\pi}{12}\right)$.</p>	<p>Answer: $\frac{1 + \sqrt{2}}{4}$</p> <p># ____ - Evaluate: $\int x^2 \cos(x^3) dx$</p>
<p>Answer: $\frac{2x \tan x - x^2 \sec^2 x}{\tan^2 x}$</p> <p># ____ - Evaluate: $\lim_{x \rightarrow \infty} \frac{5x^3 - 3}{2x^3 + 1}$</p>	<p>Answer: $y - 4 = -3(x + 1)$</p> <p># ____ - A particle moves along a horizontal line so that its position is given by $s(t) = t^3 - 9t^2 + 15t + 4$, where $t \geq 0$. When is the particle moving to the left?</p>

<p>Answer: $\frac{1}{2}$</p> <p># ____ - If x is increasing at a rate of 2 units per second, find the rate of change of θ at the instant when $x = 12$ units.</p> 	<p>Answer: $\frac{1}{8} \sin^4(2x) + C$</p> <p># ____ - Evaluate: $\int_0^4 \frac{2x}{\sqrt{9+x^2}} dx$</p>
<p>Answer: $-\frac{3}{2}$</p> <p># ____ - A spherical balloon is inflated with helium at the rate of $200\pi \text{ ft}^3 / \text{min}$. How fast is the balloon's radius increasing in ft/min at the instant the radius is 5 ft? (Volume of a sphere = $\frac{4}{3}\pi r^3$)</p>	<p>Answer: $2e^x \sin(e^x) \cos(e^x)$</p> <p># ____ - Solve for y as a function of x given $\frac{dy}{dx} = 6x^2y$ and $y(0) = 4$.</p>
<p>Answer: 4</p> <p># ____ - Evaluate: $\int_{-\pi/8}^{\pi/12} \cos(2x) dx$</p>	<p>Answer: $-\ln 3$</p> <p># ____ - If $f(x) = \sin^2(e^x)$, find $f'(x)$.</p>
<p>Answer: $y = 4e^{2x^3}$</p> <p># ____ - Solve for y as a function of x given $\frac{dy}{dx} = \frac{2x}{y}$ and $y(1) = -3$.</p>	<p>Answer: $\frac{x}{4+x^2} - \frac{1}{x}$</p> <p># ____ - $\int_0^2 \frac{x^2-2}{x+1} dx$</p>