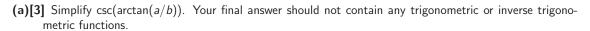
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(b)[4] Determine an equation of the tangent line to the curve $y = 3\arccos(x/2)$ at the point where x = 1.

(c)[3] Determine $\lim_{x\to 0^+} \arctan\left(1/\sqrt{x}\right)$.

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Question 2:

(a)[4] Let $f(x) = \sinh(x + \sinh^2 x)$. Determine f'(0).

(b)[6] Determine the two values of x at which the tangent lines to the curve $y = \sinh x$ have slope 2.

Question 3:

(a)[3] Evaluate
$$\lim_{x\to 1} \frac{\ln x}{\sin(\pi x)}$$
.

(b)[4] Evaluate
$$\lim_{x \to -\infty} x^2 e^{2x}$$
.

(c)[3] Evaluate
$$\lim_{x \to \infty} x^{1/(1+\ln x)}$$
 .

Question 4:

(a)[3] Evaluate
$$\lim_{x\to 1^+} \left(\frac{x}{x-1} - \frac{1}{\ln x}\right)$$
.

(b)[3] Determine the most general antiderivative of $f(x) = \frac{2}{\sqrt{1-x^2}} + \pi \sin x$.

(c)[4] Determine f(x) if $f''(x) = \frac{-1}{x^2}$ where f'(1) = 2 and f(1) = 4.

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Question 5:

(a)[4] The limit

$$\lim_{n \to \infty} \sum_{i=1}^{n} \left[1 + \left(\frac{i}{n} \right)^{2} \right] \left(\frac{1}{n} \right)$$

represents the area between the graph of y = f(x) and the x-axis over a particular interval [a, b]. Identify the function f(x) and the interval [a, b].

(b)[6] Use six subintervals and right endpoints to approximate the area under the graph of $y = \sin^2 x$ over the interval $[0, \pi]$.