Release Problems for AP Calculus AB exam 2018

1)

A tangent line drawn to the graph of $y = \frac{4x}{1+x^4}$ at the point (1,2) forms a right triangle with the coordinate axes. What is the area of the triangle?

(a) 4 (b) $\frac{9}{2}$ (c) $\frac{15}{2}$ (d) 8

(e) None of the above

2)

If
$$\int_0^k \frac{\sec^2 x}{1+\tan x} \, dx = \ln 2$$
, what is the value of k ? (a) 0 (b) 1 (c) $\pi/4$ (d) $\pi/2$ (e) 2

3)

For $g(x) = x(\ln x)^2$, evaluate the limit:

$$\lim_{x \to e} \frac{g(x) - g(e)}{x - e}.$$

(a) 1

(c) e

(d) 3

(e) None of the above

4)

The function $f(x) = x^4 - ax^2, a > 0$ has:

- (a) One relative minimum and two relative maxima
- (b) One relative minimum and one relative maximum
- (c) No relative minima and two relative maxima
- (d) Two relative minima and no relative maxima
- (e) Two relative minima and one relative maximum

5)

Which of the following functions are continuous at x = 0?

II
$$g(x) = \frac{x^3 + 3x^2 + 2x^2}{x^2 - 4x}$$

If
$$f(x) = \sqrt{x^2 + 2x}$$

If $g(x) = \frac{x^3 + 3x^2 + 2x}{x^2 - 4x}$
III $h(x) = \begin{cases} \ln|x + 1| & x \ge 0 \\ -x^2 & x < 0 \end{cases}$

(c) II and III (d) I and II

(e) None of the above