

Math 124 C – Winter 2010
Exam I Hints and Answers – Version Alpha

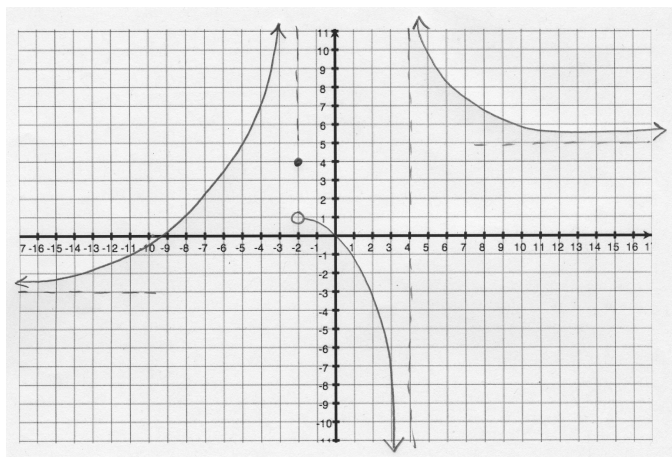
1. (3 points each)

- (a) ANSWER: -6
- (b) ANSWER: $-\infty$
- (c) ANSWER: 1
- (d) HINT: Investigate the limits from the left and the right. They are not equal.
ANSWER: does not exist

2. (3 points each)

- (a) ANSWER: $\frac{dy}{dx} = x^3 e^x + e^x \cdot 3x^2$
- (b) ANSWER: $f'(x) = \frac{(x^2 + x - 2) \cdot e^{10x} \cdot 10 - e^{10x} \cdot (2x + 1)}{(x^2 + x - 2)^2}$
- (c) ANSWER: $\frac{dy}{dx} = 4 \cos x + x^{-2} - 15x^{-4}$
- (d) ANSWER: $g'(x) = [\sec^2(x^2)] \cdot 2x$

3. (8 points)



4. (a) (4 points) ANSWERS: The line $x = -1$ is a vertical asymptote. The line $y = 2$ is a horizontal asymptote.

(b) (6 points) ANSWER: $f'(x) = \frac{2}{(x + 1)^2}$

5. (8 points) HINT: The line tangent to $g(x)$ at $x = a$ has slope $g'(a) = 2a$. On the other hand, this line goes through the two points $(a, g(a)) = (a, a^2 + 6)$ and the point $(0, -2)$. So, another expression for the slope of the same line is $\frac{a^2 + 6 - 0}{a + 2}$. Set $2a$ equal to $\frac{a^2 + 6}{a + 2}$ and solve for a .

ANSWER: $a = -2 \pm \sqrt{10}$