Similar to 10.1.Examples 7 & 8

1. $\lim_{x\to 2} \dfrac{x^3-8}{x-2} =$

(a) 12 _____ (correct)

(b) 4

(c) 0

(d) ∞

(e) -12

Similar to 10.2.Example 4

2. The number of the horizontal asysmptotes of $f(x) = \dfrac{4-x+4x^3}{1+x^2-x^3}$ is

(a) 1 _____ (correct)

(b) 2

(c) 0

(d) ∞

(e) 4

Similar to 10.2.Example 4 (c)

3. $\lim_{x\to-\infty} \dfrac{4+x+x^4}{x^2-x^3} =$

(a) ∞ _____ (correct)

(b) $-\infty$

(c) 0

(d) -1

(e) 1

4. An equation of the tangent line to the curve of $y = \dfrac{5}{1-3x}$ at $x = 0$ is

Similar to 11.1.Exercises 27 & 28

(a) $y = 15x + 5$ _____ (correct)

(b) $y = -15x + 5$

(c) $y = 5(x + 1)$

(d) $y = -5(x - 1)$

(e) $y = 15x$

Similar to 10.3.Example 5

5. Let

$$f(x) = \begin{cases} x^3 - x^2 + 1, & x \leq -1 \\ x^2 + 7x, & x > -1 \end{cases}$$

Then

(a) $\lim_{x \to -1^-} f(x) = -1$ _____ (correct)

(b) $\lim_{x \to -1^+} f(x) = -1$

(c) $\lim_{x \to -1} f(x) = -1$

(d) $f(x)$ is continuous at $x = -1$

(e) $f(x)$ is differentiable at $x = -1$

Similar to 11.4.Exercise 54

6. If $f(x) = \dfrac{x-3}{x^3+1}$, then $f'(1) =$

(a) 2 _____ (correct)

(b) -2

(c) 1

(d) -1

(e) 0

Exercise 11.3.17

7. The cost c of producing q units of a product is $c = q^2 + 50q + 1000\,\$$. The change in the cost if the production is increased from 15 to 16 units is approximately

(a) $80\,\$$ _____ (correct)

(b) $90\,\$$

(c) $65\,\$$

(d) $60\,\$$

(e) $50\,\$$

Exercise 11.3.26

8. The revenue r of selling q units of a product is $r = 2q(30 - 0.1q)\,\$$. The approximate revenue received from selling the $11th$ unit is

(a) $56\,\$$ _____ (correct)

(b) $42\,\$$

(c) $68\,\$$

(d) $30\,\$$

(e) $20\,\$$

Exercise 11.4.69 (a)

9. Suppose that a country's consumption function is given by

$$C(I) = \frac{9\sqrt{I} + 0.8\sqrt{I^3} - 0.3I}{\sqrt{I}}$$

where C and I are expressed in billions of dollars. The marginal propensity to save when the income is \$ 25 billion is

(a) 0.23 (correct)

(b) 0.77

(c) 0.34

(d) 0.66

(e) 0.32

10. The percentage rate of change of $y = (x^2 + 1)^4$ at $x = 1$ is

Exercise 11.5.63

(a) 400 % (correct)

(b) 200 %

(c) 40 %

(d) 20 %

(e) 10 %

Exercise 12.1.25

11. If $y = 9 \ln \sqrt{1 + x^2}$, then $y'(0) =$

(a) 0 (correct)

(b) 1

(c) 9

(d) 2

(e) 18

12. The supply of q units of a product at at price of p dollars per unit is given by $q(p) = 27 + 11 \ln(2p + 1)$. The rate of change of supply with respect to price is

Exercise 12.2.51

(a) $\dfrac{22}{2p+1}$ (correct)

(b) $\dfrac{11}{2p+1}$

(c) $\dfrac{2}{11(2p+1)}$

(d) $\dfrac{1}{22(2p+1)}$

(e) $\dfrac{1}{2p+1}$

Exercise 12.2.45

13. After t years, the value S of a principal of P dollars invested at the annual rate of r compounded continuously is given by $S = Pe^{rt}$. The relative rate of change of S is

(a) r (correct)

(b) e^r

(c) $\frac{r}{e}$

(d) $\frac{r}{p}$

(e) $\frac{1}{re}$

Exercise 12.4.28

14. Consider the curve given by $(x^2+y^2)^2 = 4y^2$. The value of $\frac{dy}{dx}$ at the point $(0, 2)$ is

(a) 0 (correct)

(b) 1

(c) -1

(d) 2

(e) -2

Exercise 12.4.39

15. A country's savings S is defined implicitly in terms of its national income I by the equation

$$S^2 + \frac{1}{4}I^2 = SI + I$$

where both S and I are in billions of dollars. The marginal propensity to consume when $I = 16$ and $S = 12$ is

(a) 0.375 (correct)

(b) 0.625

(c) 0.445

(d) 0.555

(e) 0.285

Math 106, Term 252, Major Exam I **Answer KEY**

Q	MASTER	1	2	3	4	5	6	7	8
1	A	E 7	C 7	C 8	A 2	E 13	A 8	D 6	A 15
2	A	E 10	D 3	D 3	E 4	A 3	B 13	C 14	B 10
3	A	E 1	C 1	A 1	E 14	A 14	B 12	E 11	A 2
4	A	B 12	B 13	E 7	C 6	A 10	B 1	D 3	E 7
5	A	A 5	B 2	B 13	E 13	D 1	A 3	A 1	B 13
6	A	A 6	A 10	B 6	C 7	E 5	D 14	D 4	D 14
7	A	C 2	B 5	E 2	E 11	D 2	A 5	A 13	C 5
8	A	D 15	E 4	D 11	B 5	C 12	B 10	B 10	B 12
9	A	E 14	C 15	B 5	A 12	D 6	E 2	A 7	B 3
10	A	E 4	C 6	C 15	C 1	D 4	E 6	C 12	A 1
11	A	D 8	E 14	D 4	C 8	C 11	D 4	E 8	D 11
12	A	C 11	A 11	E 14	C 10	B 15	A 15	C 15	D 8
13	A	B 3	D 8	C 12	B 3	A 7	C 11	B 2	D 6
14	A	B 13	B 12	C 10	E 15	B 8	A 7	B 5	E 4
15	A	B 9	C 9	A 9	C 9	B 9	A 9	C 9	B 9