

Week 1 Homework MAT 2001 (Homework)

Question 1

- (a) ~~5~~ 0
(b) ~~5~~ 6.

Question 2

- (a) ∞
(b) ∞
(c) ∞
(d) DNE

Question 3

x	$f(x)$
1.9	-7.9
1.99	-7.99
1.999	-7.999
2.001	-8.001
2.01	-8.01
2.1	-8.1

$$\lim_{x \rightarrow 2} f(x) = -8$$

Question 4

- (a) 3
(b) 7
(c) -10
(d) $-\frac{5}{2}$ or -2.5

Question 5.

-4

Question 6.

(a) f is continuous.

(b) $\lim_{x \rightarrow 0}$ does not exist, $f(0)$ does not exist.

(c) ~~$\lim_{x \rightarrow 0}$ does not exist, $\lim_{x \rightarrow 0} f(x) \neq f(0)$~~

(d) (c) ~~$\lim_{x \rightarrow 1}$ does not exist, $f(1)$ does not exist.~~

(d) $\lim_{x \rightarrow 3}$ does not exist.

Question 7

The function is discontinuous at $x = -7$.

Question 8.

The function is discontinuous at $x = 1$.

Question 9.

The function is continuous.

Question 10.

(a) $x = -4$, $x = 5$.

(b) 2.

(c) 2.

(d) $y = 2$.

Question 11

(a) 5.

(b) 7

Question 12.

(a) 36.

(b) 36.

(c) $(2, 36)$

Question 13.

(a) $P(x, y) = (0, -1)$, $A(x, y) = (-4, 1)$

(b) $-\frac{1}{2}$.

(c) $\neq -\frac{1}{2}$.

(d) $-\frac{1}{2}$.

Question 14.

(a) $4q + 1$

(b) $4q + 1$ at $q = 9$, $\neq \underline{\underline{37}}$

(c) ~~36~~ 37

Question 15.

$$y = \frac{1}{2}x - \frac{5}{2}.$$

Question 16.

$$y' = 14x - 9$$

Question 17

$$192x'' + 36x^5 - 6x + 19.$$

Question 18

$$\frac{d}{dt} (3t^{\frac{14}{3}}) = 17t^{\frac{14}{3}}$$

$$\frac{d}{dt} (-2t^{\frac{7}{4}}) = -\frac{7}{2}t^{\frac{3}{4}}$$

$$\frac{d}{dt} (-t^{\frac{1}{2}}) = -\frac{1}{2}t^{-\frac{1}{2}}.$$

$$\frac{d}{dt} (5) = 0.$$

$$Z' = \frac{34t^{\frac{31}{6}} - 7t^{\frac{5}{4}} - 1}{2\sqrt{t}} \quad \text{OR} \quad 17t^{\frac{14}{3}} - \frac{7}{2}t^{\frac{3}{4}} - \frac{1}{2}t^{-\frac{1}{2}}.$$

Question 19

$$\frac{-18x^{\frac{2}{3}} - 4x^{\frac{14}{3}} + 3x^7}{x^{\frac{23}{3}}} \quad \text{OR} \quad -18x^{-7} - 4x^{-3} + 27x^k$$

Question 20.

$$y(1) = 2.$$

$$y' = 3x^2 - 10x.$$

$$y'(1) = -7$$

WEEK 1 QUIZ MAT 2601 (HOMEWORK)

Question 1

-8.

Question 2.

a) -1

b) -19

c) $-\frac{30}{11}$

Question 3

a) $\lim_{x \rightarrow -2}$ does not exist.

b) f is continuous.

c) $\lim_{x \rightarrow 5}$ does not exist. $f(5)$ does not exist.

(c) $f(5)$ does not exist.

(d) $f(-4)$ does not exist.

Question 4

- (a) No, the function is not continuous for all values of t .
- b) Yes, the function is continuous at $t = 14$.
- (c) Yes, the function is continuous for all $t \geq 0$.
- (d) $(-\infty, -\frac{1}{2}) \cup (-\frac{1}{2}, \infty)$

Question 5

- (a) 14
- (b) 14
- (c) (2, 21)

Question 6

- (a) $8x + 3$
- (b) ~~$8x + 3$~~ $f'(x) = 8x + 3$
 $f(-4) = -29$
- (c) -29

Question 7

$$y = 6x - 22$$

Question 8

- (a) 47
- (b) ~~$y = 47x - 91$~~ $y = 8x + 7$

Question 9.

$$y' = 55x^4 - 12x^2 + 3$$

Question 10

$$h'(x) = \frac{81}{x^{10}} - \frac{25}{x^6} + \frac{2}{\sqrt{x}}$$