

Intro to Calc.
Mid-Term Review Answers

1.1 + 1.02

① $g(3) = 4$; $g(-1) = 0$

② $g(\pi) = \sqrt{\pi+1}$; $g(1) = \sqrt{2}$

③. yes, $d: [0, \infty)$
 $r: [0, \infty)$
 $x=0$

④. $(-\infty, -3] \cup [3, \infty)$

⑤ $(-\infty, 1) \cup (1, 3) \cup (3, \infty)$

⑥ $x=2$ hole, $x=-2$ V.A.

7a). $x=2$, $x=4$

b). never

c). $(-\infty, 2]$ and $[4, \infty)$

d) $y = -1$ min

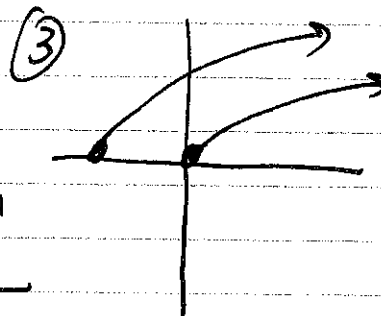
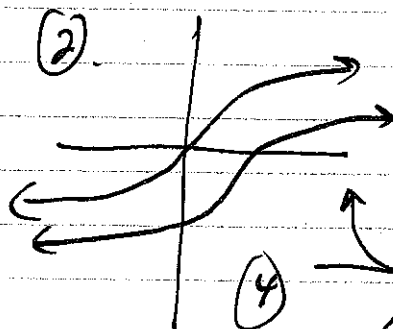
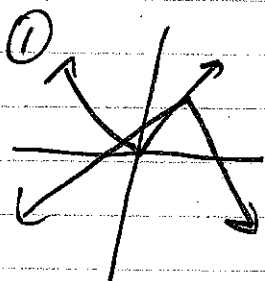
⑧. Cont.
disc.
cont.

9b) $(0, 3)$

c) $(0.96, \frac{16}{3})$

d) 16 in

1.4



1.4

5). neither, none

6). even, y-axis

7). odd, origin

8). $f \circ g(x) = x^2 + 7x + 6$
 $(-\infty, \infty)$

$$(f-g)(x) = x^2 - 7x - 8$$

$(-\infty, \infty)$

$$(fg)(x) = 7x^3 + 7x^2 - 7x - 7$$

$(-\infty, \infty)$

$$\frac{f}{g}(x) = \frac{x-7}{1} \quad (-\infty, -1) \cup (-1, \infty)$$

9). $\frac{f(x)}{g(x)} = \frac{2 + \sqrt{x+3}}{x+1} \quad [-3, -1) \cup (-1, \infty)$

10). a). $f(g(x)) = \sqrt{2x-2} \quad [0, \infty)$

b). $g(f(x)) = \sqrt{2x-4} \quad [2, \infty)$

11). $x+3$

1.5

1). $y = 7x + 2$

2). $y = 2x - 2$

3). $y = 3x + 3$

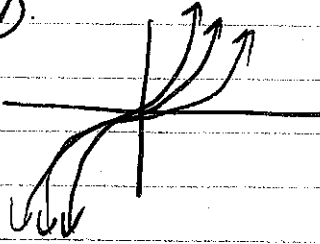
4). $y = \frac{1}{6}x + \frac{10}{3}$

5). $\theta = 80^\circ$

6). $\theta = 60^\circ$

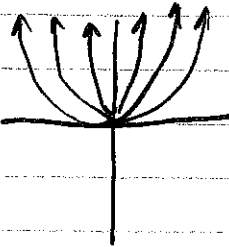
1.6

①



the larger the degree,
the flatter or closer to x-axis.

②



3). $y=0$

4). $P = \frac{2\pi}{b}$ $\text{Ampl} = 3$

$P = \frac{2\pi}{0.5}$

$P = 4\pi$

5) ~~$y = 5 \sin$~~

~~$y = 5$~~
 $y = 5 \sin 3.9x$

⑥. right $\frac{\pi}{3}$

⑦. 2

⑧. $y = 4 \cos 2(x - \frac{\pi}{2}) - 1$

2.1

- ① a). 4.5
- b). 4.5
- c). 4.5
- d). -2
- e). $-\infty$
- f). ∞

- ② a). 1
- b). 1
- c). 1
- d). ∞
- e). ∞

- 3) 4
- 4) DNE
- 5a). 2
- b). 2
- c). 2
- d). 2
- e). $-\infty$
- f). $-\infty$

2.2

- 1) a) 7
- b) -6
- c) 37

- 2) a) -6
- b) 16
- c) -8
- d) $-\frac{1}{2}$

3) DNE

4) 0

5) DNE

6) -4

2.3

- 1) $+\infty$
- 2) $-\infty$
- 3) $\frac{1}{2}$

4) $\sqrt[3]{\frac{1}{2}}$

5) $\frac{1}{3}$

2.5

1) ~~not~~ continuous

2) ~~not~~ continuous

3) $x=2, x=-2$

4) $x=3, x=2$

5) continuous

3.1

1. 8
2. 6
3. 3

3.2

- 1) a) $6x$
- b) 12
- c) $y = -6x - 1$

2) $y' = 6x + 1$

3) $y' = \frac{-1}{(x-4)^2}$

4) $\frac{3}{2\sqrt{3x+1}}$

- 5) A \rightarrow II
- B \rightarrow IV
- C \rightarrow I
- D \rightarrow III

3.3

1. 0
2. $4x^3$
3. $-36x''$
4. $24x^{7+2}$
5. $18x^2 - \frac{3}{2}x + 12$
6. $\frac{3}{(2x+1)^2}$

7). 2,076,318,720

8. $360x^2$

3.5

1). $-2x \sin(x^2+9)$

2). $-\frac{(3x^2+2)}{(x^3+2x-3)^2}$

3). $\frac{-8x^3}{3(-2x^4+5)^{2/3}}$

4). $15x^4 \cos x^5$

5). $-20 \cos^4 x \times \sin x$

or $-20x \cos^4 x \sin x$

3.4

1. $-2\sin x - 3\cos x$
2. $-\sin^2 x + \cos^2 x$
3. $\frac{x \cos x - \sin x}{x^2}$

4. $\sec^3 x + \sec x \tan x$

5. $-\frac{\sqrt{2}}{2}$