

Calculus Summer Review Packet 2007

Part I

1. $\frac{1}{x+1}$

2. $x^2 + 2x + 4$

3. $-\frac{1}{x+5}$

4. $\frac{x-8}{x-4}$

Part II

1. 1

2. $\sec^2 x$

3. $\csc^2 x$

4. $\cos^2 x - \sin^2 x$

5. $2 \sin x \cos x$

Part III

1. $-\frac{h}{x(x+h)}$

2. $\frac{x^3}{5}$

3. $-\frac{1}{(3+x)^3}$

4. $\frac{x^2 + 15}{(x-3)^2(x+1)}$

Part IV

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

2. $z = \frac{4x - y^2}{3y - 8}$

Part V

1. 13

2. $30 - \sqrt{2}$

3. 4

4. $\sqrt{51}$

5. $\{(5,3), (4,2), (7,1)\}$

6. $\sqrt{x-5}$

7. $\{(3, \frac{1}{5}), (2, \frac{1}{4}), (1, \frac{1}{7})\}$

8. $(x^2 + 5)\sqrt{x-3}$

Part VI

1. $2x - 2 + h$

2. $x^3 + 3x^2y + 3xy^2 + y^3$

3. $x^4 - x^{\frac{7}{2}} + x^{\frac{5}{2}}$

4. $x = \frac{1}{4}y^2 + 3$

Part VII

1. 15

2. (error)

Answer Key

Part VIII

1. $\frac{\sqrt{x}}{x}$

3. ex

5. 7

7. -3

9. x^3

11. 9

13. $8a^{5/2}$

2. 3

4. 0

6. -1

8. $-\ln 2$

10. $\frac{x^{\frac{4}{3}}y^3}{3}$

12. $20a^{13/6}$

14. $\frac{3(n+1)}{5}$

Part IX

1. $y-4=-2(x-3)$

2. $y+3=-\frac{5}{6}(x-1)$ or $y-2=-\frac{5}{6}(x+5)$

3. $y=2$

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

Part X

1. $-\mathbf{i}+\frac{5}{2}\mathbf{j}$

2. $5\mathbf{i}-\mathbf{j}$

3. 5

4. $-\frac{2}{\sqrt{29}}\mathbf{i}+\frac{5}{\sqrt{29}}\mathbf{j}$

Part XI

1. 0

2. 1

3. $\frac{\sqrt{2}}{2}$

4. -1

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

6. $\frac{1}{2}$

7. -1

8. $\frac{\sqrt{3}}{3}$

9. $-\sqrt{3}$

10. $\frac{\sqrt{3}}{2}$

11. $-\frac{\pi}{6}$

Part XII

1. $D = [4, \infty); R = [0, \infty)$

2. $D = (-\infty, -2) \cup (2, \infty); R = [0, \infty)$

3. $D = [-2, 2]; R = [0, 2]$

4. $D = [4, \infty); R = [0, \infty)$

Answer Key

Part XIII

1. $(-3, -4), (5, 36)$

2. $(\frac{\pi}{4} + 2\pi k, \frac{\sqrt{2}}{2})$

Part XIV

1. $x = -6,3$

2. $x = -1,1$

3. $x = 2,8$

4. $x = \frac{-5 \pm \sqrt{89}}{4}$

5. $x < -3$ or $x > 3$

6. $-3 \leq x \leq 5$

7. $x = 0, \frac{1}{4}$

8. $x = 0, \frac{\pi}{3}, \pi, \frac{5\pi}{3}$

9. $-4 < x < 10$

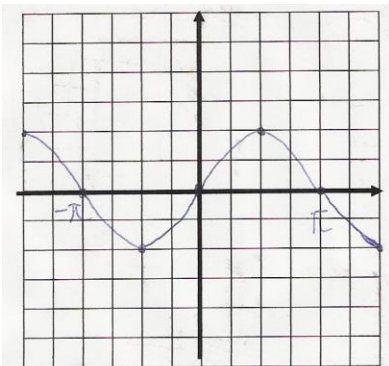
10. $x = -1, \frac{1}{2}, 2$

11. $x = -\frac{3}{2}$

12. $x = 5$

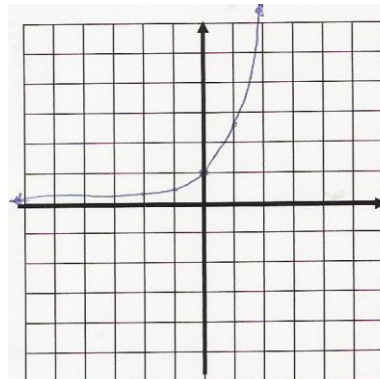
Part XV

1.



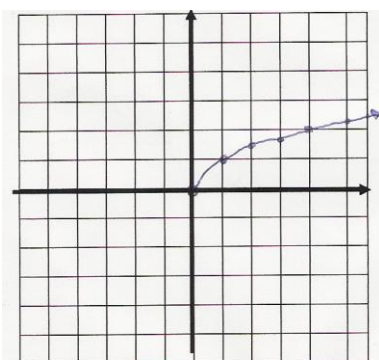
Domain \mathbb{R}
 Range $\{y \in \mathbb{R} \mid -1 \leq y \leq 1\}$

2.



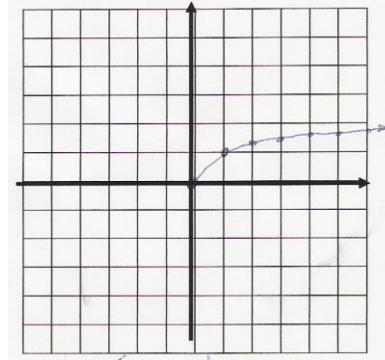
Domain \mathbb{R}
 Range $\{y \in \mathbb{R} \mid y > 0\}$

3.



Domain $\{x \in \mathbb{R} \mid x \geq 0\}$
 Range $\{y \in \mathbb{R} \mid y \geq 0\}$

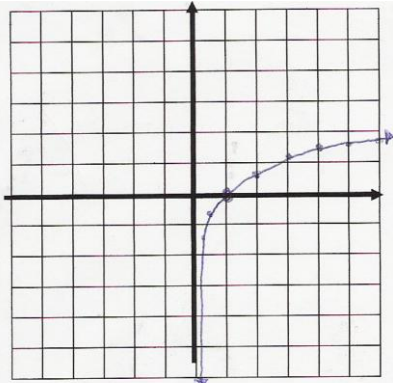
4.



Domain $\{x \in \mathbb{R} \mid x \geq 0\}$
 Range $\{y \in \mathbb{R} \mid y \geq 0\}$

Answer Key

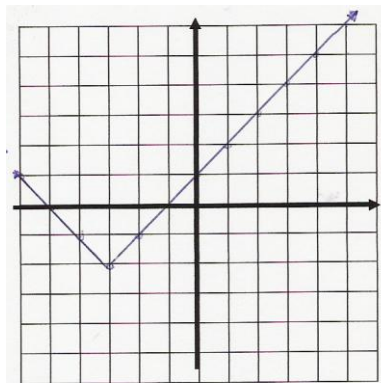
5.



Domain $\{x \in \mathbb{R} \mid x \geq 0\}$

Range \mathbb{R}

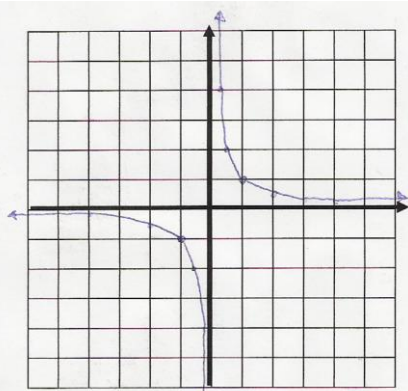
6.



Domain \mathbb{R}

Range $\{y \in \mathbb{R} \mid y \geq -2\}$

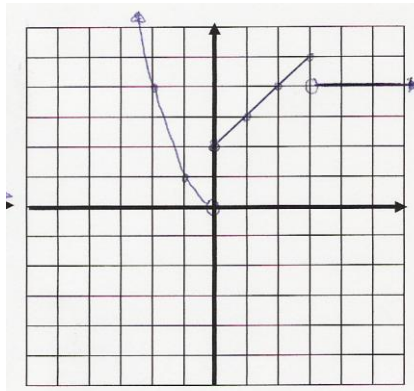
7.



Domain $\{x \in \mathbb{R} \mid x \neq 0\}$

Range $\{y \in \mathbb{R} \mid y \neq 0\}$

8.



Domain \mathbb{R}

Range $\{y \in \mathbb{R} \mid y > 0\}$

Part XVI

1. circle
2. vertical line
3. cardioid
4. 3-leaved rose