This print-out should have 6 questions. Multiple-choice questions may continue on the next column or page – find all choices before answering.

001 10.0 points

Find $\lim_{(x,y)\to(6,-2)} \left(x^5 + 3x^3y - 6xy^2\right)$.

1. 6336

2. 8928

3. 6624

4. 9216

5. 6192

002 10.0 points

Find $\lim_{(x,y)\to(6,2)} xy\cos(x-3y)$.

1. -12

2. 2

3. 12

4. 0

5. 6

003 10.0 points

Suppose that $\lim_{(x,y)\to(3,7)} f(x,y) = 2$.

What is the value of $f(3,7)$ if f is continuous?

1. 7

2. 9

3. 5

4. 3

5. 2

004 10.0 points

Determine the set of points at which the function

$$f(x,y,z) = \frac{xyz}{8x^2 + 2y^2 - z}$$

is continuous.

1. $\left\{(x,y,z) | z \neq -8x^2 - 2y^2\right\}$

2. $\left\{(x,y,z) | z \neq 8x^2 + 2y^2, xyz > 0\right\}$

3. $\left\{(x,y,z) | z \neq 8x^2 + 2y^2\right\}$

4. $\left\{(x,y,z) | xyz > 0\right\}$

5. $\left\{(x,y,z) | z \neq 8x^2 + 2y^2, xyz < 0\right\}$

005 10.0 points

Determine the set of points at which the function

$$f(x,y,z) = \sqrt{8x + 4y + 7z}$$

is continuous

1. $\left\{(x,y,z) | 8x + 4y + 7z \neq 0\right\}$

2. $\left\{(x,y,z) | x \geq 0, y \geq 0, z \geq 0\right\}$

3. $\left\{(x,y,z) | 8x + 4y + 7z > 0\right\}$

4. $\left\{(x,y,z) | 8x + 4y + 7z \geq 0\right\}$

5. $\left\{(x,y,z) | xyz \geq 0\right\}$

006 10.0 points

Find $\lim_{(x,y)\to(0,0)} \dfrac{4\left(x^2 + y^2\right)}{\sqrt{x^2 + y^2 + 9} - 3}$, if it exists.

1. 4

2. 12

3. The limit does not exist.

4. 24

5. 0