

Name _____ Test 3 – Coronavirus Edition, Spring 2020

Instructions:

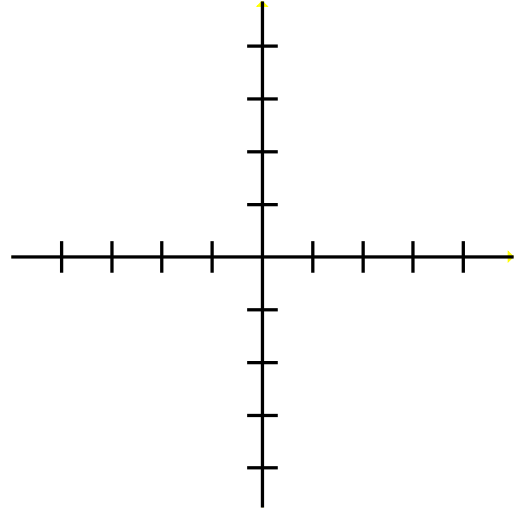
- You will need to submit two things:
 - Your answers must be submitted on Blackboard under “**Test 3**” by **9:30am** today.
 - Your supporting work must be submitted shortly afterward under “**Test 3 Work**”. Your work must match the answers you submit.
- This test is open notes, book, internet, etc. You may use any static resources you like, but may not ask any person for assistance. As such, significantly more points will be weighted on the explanations and work than the answers themselves. Seriously, very clearly show your work, if it looks like a computer algebra system gave you an answer and you don’t understand what it means, you will not receive credit.

Part 1: Computational Skills and Conceptual Understanding Combined

1) Convert the rectangular coordinates $(2, \sqrt{12})$ to polar coordinates and explain what it means.
(10 points)

2) How many leaves does the function $r = \sin(1176\theta)$ have? Why? (10 points)

3) Graph the vector $\langle -2, 5 \rangle$ on the axis below. (10 points)



4) Find $\langle 1, 2, 3 \rangle \times \langle -2, 0, 4 \rangle$. Show your work. (10 points)

5) The function $f(t)$ is a line through the point $\langle 1,2,3 \rangle$ in the direction $\langle -2,0,4 \rangle$. Find an equation that describes $f(t)$. (10 points)

6) A plane has normal vector $\langle 1,3,2 \rangle$ and does not go through the origin. Find an equation for this plane and explain your answer. (10 points)
(There are multiple correct answers. Choose one)

Part 2: Review

7) Find the integral below. Show your work. (10 points)

$$\int x \sin(3x) dx$$

8) Find the integral below. Show your work. (10 points)

$$\int \frac{1}{(x+2)(x-3)} dx$$

9) Determine whether the series converges or diverges. Circle which test(s) you use. Explain your answer. (10 points)

[Divergence Test] [Integral Test] [Comparison Test] [Limit Comparison Test] [Ratio Test] [Root Test] [Geometric Series] [p-Series] [Alternating Series]

$$\sum_{k=1}^{\infty} \frac{1}{k^2 + 7}$$

10) Determine whether the series converges or diverges. Circle which test(s) you use. Explain your answer. (10 points)

[Divergence Test] [Integral Test] [Comparison Test] [Limit Comparison Test] [Ratio Test] [Root Test] [Geometric Series] [p-Series] [Alternating Series]

$$\sum_{k=1}^{\infty} \frac{k^3}{2^k}$$