

MTH 2227 Test #1

SPRING 2018

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Name _____

Instructions. Show clearly how you arrive at your answers. Document your work.

1. Compute $\text{proj}_v(\tilde{\mathbf{u}})$ and $\text{orth}_v(\tilde{\mathbf{u}})$ if $\tilde{\mathbf{u}} = \langle 2, 6 \rangle$ and $\tilde{\mathbf{v}} = \langle 5, 3 \rangle$.

2. Graph the equation $r = 1 - 2 \sin(\theta)$ **Note:** $\frac{\sqrt{2}}{2} \approx 0.707$ $\frac{\sqrt{3}}{2} \approx 0.866$
 $\sqrt{2} \approx 1.414$ $\sqrt{3} \approx 1.732$

$\theta =$	$r = 1 - 2 \sin(\theta)$	■ ■	$\theta =$	$r = 1 - 2 \sin(\theta)$
0		■ ■		
$\frac{\pi}{6}$		■ ■	$\frac{7\pi}{6}$	
$\frac{\pi}{4}$		■ ■	$\frac{5\pi}{4}$	
$\frac{\pi}{3}$		■ ■	$\frac{4\pi}{3}$	
$\frac{\pi}{2}$		■ ■	$\frac{3\pi}{2}$	
$\frac{2\pi}{3}$		■ ■	$\frac{5\pi}{3}$	
$\frac{3\pi}{4}$		■ ■	$\frac{7\pi}{4}$	
$\frac{5\pi}{6}$		■ ■	$\frac{11\pi}{6}$	
π		■ ■	2π	

3. Given the function $r = 1 - 2 \sin(\theta)$ from the previous exercise, find the area bounded by the “inner loop” of the graph.

4. Determine which vectors (if any) are parallel and which (if any) are perpendicular (orthogonal). $\tilde{\mathbf{u}} = \langle 3, 0, -1 \rangle$; $\tilde{\mathbf{v}} = \langle 3, 3, 9 \rangle$; $\tilde{\mathbf{w}} = \langle 2, 2, 6 \rangle$.

5. Find the slope of the graph in the x - y plane, given parametrically by $x = e^t$ and $y = \sin(\pi t)$ when $t = 0$.

6. Find the angle, θ , between the vectors $\tilde{\mathbf{u}} = \langle 4, 2, 3 \rangle$ and $\tilde{\mathbf{v}} = \langle 1, -1, -\frac{1}{2} \rangle$