Review for Exam 1

Review Homework Problems from

pages 8-9 (omit #22)

page 19 (omit #13-14)
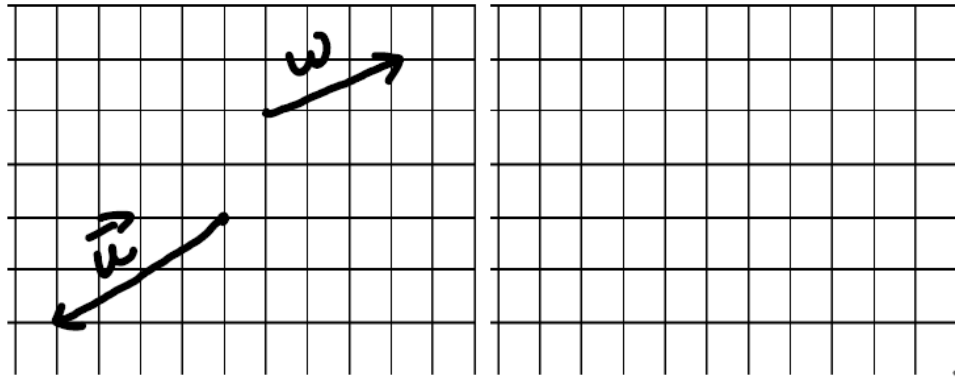
page 25

pages 31-32

page 39 (omit #13-14)

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Page 55 (#1-17 only)

1) Graph $\vec{u} - 2\vec{w}$.

2) Graph $\overrightarrow{2u} + 3\vec{w}$.

3) Find a unit vector in the direction of $\vec{v} = 7i - 3j$

4) Given that $\|\vec{v}\| = 12$ and $\theta = 135°$, write $\vec{v}$ in the form $ai + bj$. Give exact answer with no decimals.

5) Given that $\vec{u} = 4i - 3j$ and $\vec{v} = -7i + 9j$,

 a) Find $2u \cdot v$

 b) Find the angle between u and v.

6) An airplane has an airspeed of 600km/hr bearing 30 degrees east of south. The wind veloicity is 40 km/hr in the direction of 45 degrees west of north. Find the resultant vector representing the path of the plane relative to the ground. What is the ground speed of the plane? What is its direction?

7) Find the position vector of $v = \overrightarrow{P_1 P_2}$ if $P_1 = (-2, 2, 3)$ and $P_2 = (4, 3, -3)$

8) Given the two vectors $v = -i + 3j + 2k$ and $w = 3i - 2j - k$, find $v \times w$.
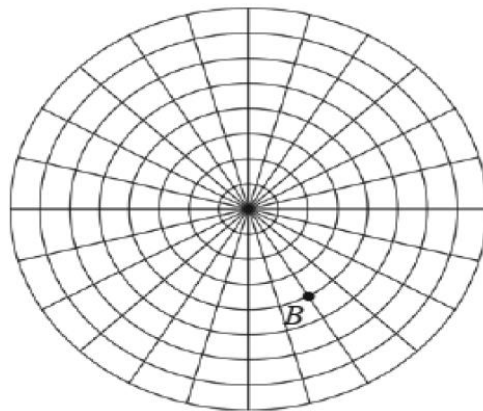
9) Given the point B on the graph, give 4 different polar coordinates for point B with the following restrictions. Give your answers in radians.

 a) $r > 0$, $\quad 0 \le \theta < 2\pi$
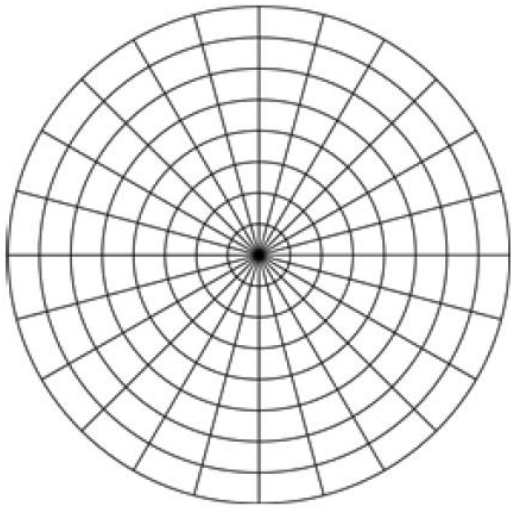
 b) $r < 0$, $\quad 0 \le \theta < 2\pi$

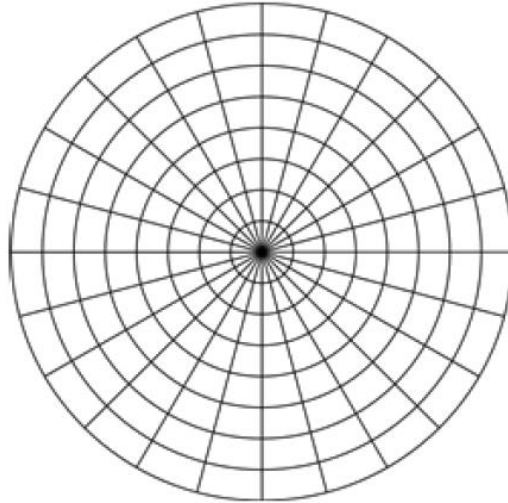 c) $r > 0$, $\quad 0 \le \theta < 2\pi$

 d) $r < 0$, $\quad 0 \le \theta < 2\pi$

10. Graph and complete the table.

a)　　$r = 2 - 4\cos\theta$

θ	r
0°	
90°	
180°	
270°	

b)　　$r = 3 + 3\sin\theta$

θ	r
0°	
90°	
180°	
270°	

11. Find where the graph passes through the pole for #10a and b.

12. Graph the following.

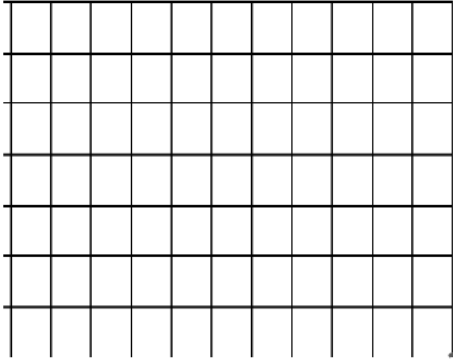a)　　$r^2 = 25\cos(2\theta)$

b)　　$\theta = \dfrac{2\pi}{3}$
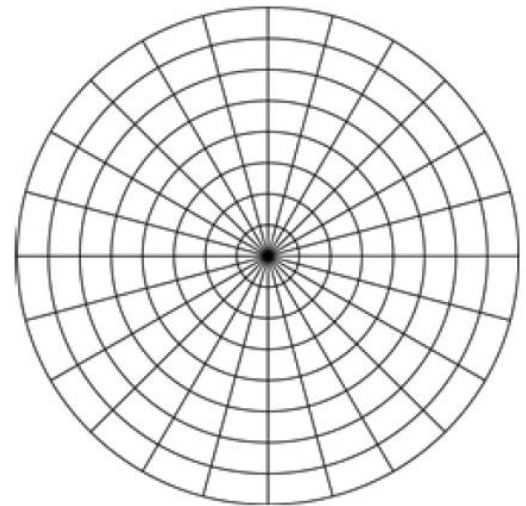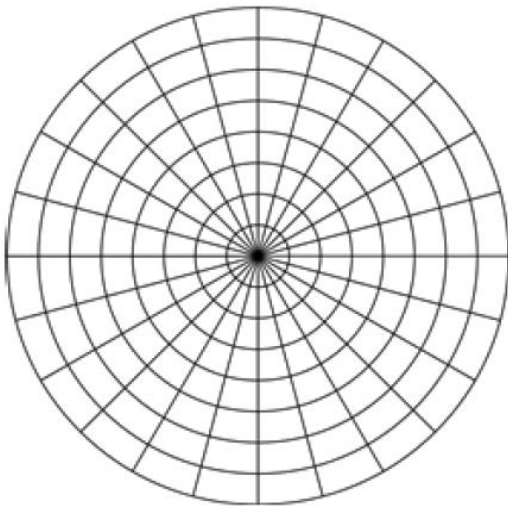
13. Answer the following questions about the equation

$r = 4\sin(6\theta)$

    a) How many petals are there?_____

    b) How far apart is each petal (spacing) ?_____

    c) Where is the first petal located (at what angle)?_____

14. Plot the complex number $z = -5 + 3i$. Write z in polar form. Give your answer in degrees $0° \le \theta < 360°$.

15) Given $z = 2(cis\,(80°))$ and $w = 6(cis\,(200°))$ find the following. Leave answers in polar form.

    $0° \le \theta < 360°$.

    a) zw

    b) $\dfrac{z}{w}$

16) Given $z = \sqrt{2}\left(cis\left(\dfrac{5\pi}{16}\right)\right)$, find z^4. Write your final answer in the rectangular form $z = a + bi$.

17) Given that $z = 4 + 4i$, find z^6. Write your final answer in the rectangular form $z = a + bi$.

18) Graph the following over a one period interval. Label the x and y values of the points used to create the graph.

    a) $y = 3\sin\left(2x + \dfrac{\pi}{2}\right) - 1$

    b) $y = -2\cos\left(\dfrac{1}{2}x - \dfrac{\pi}{4}\right) + 1$

    c) $y = \dfrac{1}{2}\tan\left(2x - \dfrac{\pi}{3}\right) + 2$

    d) $y = 2\cot\left(\dfrac{1}{2}\pi x + \dfrac{\pi}{4}\right) - 1$

    e) $y = 3\csc\left(2x - \dfrac{\pi}{4}\right) - 1$

    f) $y = -\dfrac{1}{3}\sec\left(\dfrac{1}{2}x + \dfrac{\pi}{3}\right)$