Math 36

Test 4 Pretest, Chapter 8

Round each part in the *answer* to the nearest tenth, unless otherwise indicated.

Section 8.2 Formulas:

1. A vectors components, $\langle a, b \rangle$, are defined by $a = |\mathbf{V}| \cos\theta$ and $b = |\mathbf{V}| \sin\theta$.

2. A vector's **direction angle**, $0° \le \theta < 360°$, is defined by first finding $\hat{\theta}$, using either $\cos\hat{\theta} = \frac{|a|}{|\mathbf{V}|}$ or $\sin\hat{\theta} = \frac{|b|}{|\mathbf{V}|}$. To find θ, either add or subtract $\hat{\theta}$ with 180° or 360°, depending in which quadrant **V** lies.

3. The angle measure, α, between the two vectors, **V** and **W**: $\cos\alpha = \frac{\mathbf{V} \bullet \mathbf{W}}{|\mathbf{V}|\,|\mathbf{W}|}$; $0° \le \alpha \le 180°$.

Section 8.1:

Given two vectors $\mathbf{U} = \langle -12, -\frac{9}{4} \rangle$ and $\mathbf{V} = \langle \frac{3}{5}, -6 \rangle$, find the following

1. $\mathbf{B} = 4\mathbf{U} - 10\mathbf{V}$

2. $\mathbf{D} = \frac{8}{3}\mathbf{U} + \frac{10}{3}\mathbf{V}$

Given two vectors $\mathbf{G} = -2\mathbf{i} + 6\mathbf{j}$ and $\mathbf{H} = 3\mathbf{i} - 9\mathbf{j}$, find the following. Write each answer in **i, j** form.

3. $\mathbf{X} = \mathbf{G} - \mathbf{H}$

4. $\mathbf{Z} = \frac{3}{2}\mathbf{G} + \frac{5}{3}\mathbf{H}$

Section 8.2:

Given the magnitude and direction angle of a vector, find its components.

5. $|\mathbf{K}| = 40$ and $\theta = 78.5°$

6. $|\mathbf{L}| = 8$ and $\theta = 164°$

7. $|\mathbf{M}| = 15$ and $\theta = 199°$

8. $|\mathbf{N}| = 56$ and $\theta = 333°$

Find the **direction angle**, θ, of the given vector. Round θ to the nearest tenth of a degree.

9. $\mathbf{A} = \langle 9, 2 \rangle$

10. $\mathbf{B} = \langle -6, 7 \rangle$

11. $\mathbf{C} = \langle -3, -2 \rangle$

12. $\mathbf{D} = \langle 6, -11 \rangle$

Given two vectors, find the angle, α, between them. Round α to the nearest whole number.*

13. $\mathbf{V} = \langle -4, 15 \rangle$ and $\mathbf{W} = \langle 9, -5 \rangle$

14. $\mathbf{S} = \langle 2, 9 \rangle$ and $\mathbf{T} = \langle 3, 1 \rangle$

15. $\mathbf{X} = \langle -8, 6 \rangle$ and $\mathbf{Y} = \langle -9, -12 \rangle$

16. $\mathbf{P} = \langle 6, -10 \rangle$ and $\mathbf{Q} = \langle -9, 15 \rangle$

*For #13-16, use this following outline:

i) Find both $|\mathbf{V}|$ and $|\mathbf{W}|$

ii) Find the dot product $\mathbf{V} \bullet \mathbf{W}$

iii) Find α using the $\cos\alpha$ formula, above.