

Unit 8 Test

Law of Sines/Cosines, Vectors, Polar Coordinates & Parametric Equations

Name: _____ Date: _____ Score: ____ / 10

INSTRUCTIONS

For multiple-choice questions, circle the letter of the correct answer. For short-answer and problem-solving questions, show your complete work in the space provided. No calculator unless your teacher says otherwise.

1

In a triangle, $a = 10$, $A = 30^\circ$, and $B = 45^\circ$. Use the Law of Sines to find side b .

Multiple Choice

A $10\sqrt{2}$ **B** $5\sqrt{2}$ **C** $10\sqrt{3}$ **D** 15**2**

In a triangle, $a = 7$, $b = 9$, and $C = 60^\circ$. Use the Law of Cosines to find side c .

Multiple Choice

A $\sqrt{67}$ **B** $\sqrt{130}$ **C** $\sqrt{30}$ **D** 4**3**

Short Answer — A triangle has sides $a = 8$, $b = 6$, $c = 10$. Use the Law of Cosines to find angle C (opposite side c).

Short Answer

4

If $\mathbf{u} = (3, -2)$ and $\mathbf{v} = (-1, 5)$, find $\mathbf{u} + \mathbf{v}$.

Multiple Choice

A (2, 3)**B** (4, -7)**C** (2, 7)**D** (-3, -10)**5**

Find the magnitude of the vector (3, 4).

Multiple Choice

A 5**B** 7**C** 12**D** 25**6**

Short Answer — Find the unit vector in the direction of (6, 8).

Short Answer

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7

Convert the polar point $(r, \theta) = (4, \pi/3)$ to rectangular coordinates.

Multiple Choice

☐ A $(2, 2\sqrt{3})$ ☐ B $(2\sqrt{3}, 2)$ ☐ C $(4, \pi/3)$ ☐ D $(2, \sqrt{3})$

8

Convert the rectangular point $(0, -5)$ to polar coordinates using $r > 0$ and $0 \leq \theta < 2\pi$.

Multiple Choice

☐ A $(5, 3\pi/2)$ ☐ B $(5, \pi/2)$ ☐ C $(-5, 3\pi/2)$ ☐ D $(5, \pi)$

9

Problem Solving — Two forces act on an object: 40 N due east and 30 N due north. Find the magnitude of the resultant force and its direction (angle above east), rounded to the nearest hundredth of a degree.

Problem Solving

10

Problem Solving — Given the parametric equations $x = 2t + 1$ and $y = t^2 - 3$, eliminate the parameter to find the rectangular equation, and identify the type of curve.

Problem Solving