Find the angle between the two vectors.
B) $\mathbf{u} = \langle -3,5 \rangle$, $\mathbf{v} = \langle -2,-6 \rangle$

Determine if the vectors are parallel, orthogonal, or neither.
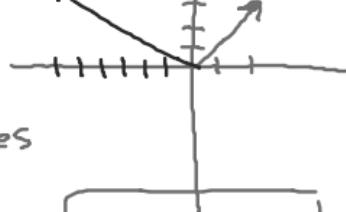A) $\mathbf{u} = \langle 2,3 \rangle$, $\mathbf{v} = \langle -6,4 \rangle$ | B) $\mathbf{u} = \langle -3,5 \rangle$, $\mathbf{v} = \langle -2,-6 \rangle$

orthogonal
- perpendicular
opposite slopes
reciprocal slopes

$u \cdot v = (2)(-6) + 3(4)$
$= -12 + 12$
$= 0$

$v = $ slope $= \frac{4}{-6} = \left(-\frac{2}{3}\right)$

$u \to$ slope $= \frac{3}{2}$

Orthogonal

B)
$u \cdot v = 6 + (-30) = -24$
Not orthogonal

Slope $= \frac{5}{-3}$ u   slope $\vec{v} = \frac{-6}{-2} = 3$

Not parallel

C) $\mathbf{u} = \langle -2,10 \rangle$, $\mathbf{v} = \langle -1,5 \rangle$

$u \cdot v = 2 + 50 = 52$
Not orthogonal

$m = \frac{10}{-2}$ $m = \frac{5}{-1}$

parallel

D) $\mathbf{u} = \langle -2,10 \rangle$, $\mathbf{v} = \langle 1,-5 \rangle$

$U \cdot v = -2 + (-50) = -52$
Not orthogonal

$m = \frac{10}{-2}$ $m = \frac{-5}{1}$

parallel

9|Page
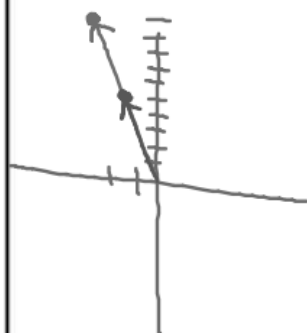
What you'll Learn About
- Parametric Equations/Parametric Curves/Eliminating the Parameter
- Lines and Line Segments/Simulating Motion with a grapher
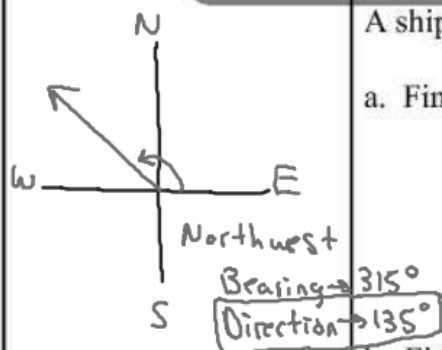
A ship is heading northwest at 12 mph.

N

W ———————— E

Northwest

Bearing → $315°$

Direction → $135°$

S

a. Find the component form of the ship after 1 hour.

$$X = |ship|\cos\theta \qquad y = |ship|\sin\theta$$

$$X = 12\cos 135° \qquad y = 12\sin 135°$$

b. Find the component form of the ship after 2 hours.

$$x = 24\cos 135° \qquad y = 24\sin 135°$$

c. Find the component form of the ship after 3 hours.

$$x = 36\cos 135° \qquad y = 36\sin 135°$$

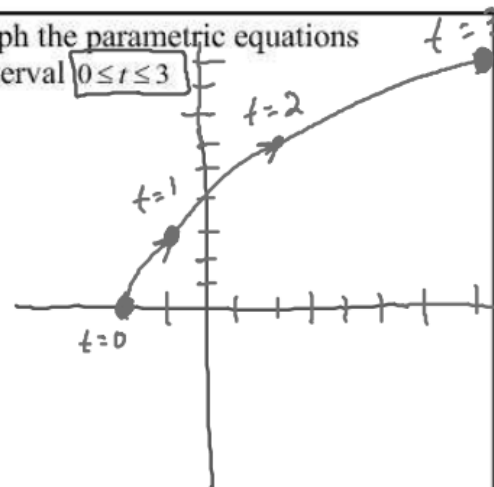d. Write the parametric equations for the boat at any time t.

$$X = 12t\cos 135° \qquad y = 12t\sin 135°$$

For the given parameter interval, graph the parametric equations

A. $x = t^2 - 2$ $y = 3t$ on the interval $\boxed{0 \le t \le 3}$

$x = t^2 - 2$ $y = 3t$

t	x	y
0	−2	0
1	−1	3
2	2	6
3	7	9

B. $x = t^2 - 2$ $y = 3t$ on the interval $0 \le t \le 5$

C. $x = t^2 - 2$ $y = 3t$ on the interval $-3 \le t \le 1$

D. $x = t^2 - 2$ $y = 3t$ on the interval $-\infty \le t \le \infty$