Week 6 Problem Set (5398482)

Question	1 2 3 4 5 6 7 8 9 10

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1. Question Details   OSColPhys1 6.P.001.WA. [2611722]

(a) Express the following angles in radians.

$25° =$ ☐ 🔧 0.436 rad
$35° =$ ☐ 🔧 0.611 rad
$80° =$ ☐ 🔧 1.4 rad
$250° =$ ☐ 🔧 4.36 rad

(b) The following angles are in units of radians. Express them in degrees.

$\pi/5 =$ ☐ 🔧 36 °
$0.60\pi =$ ☐ 🔧 108 °
$1.6\pi =$ ☐ 🔧 288 °
$8\pi =$ ☐ 🔧 1440 °

(c) The following angles are in units of radians. Express them in units of revolutions.

$\pi/5 =$ ☐ 🔧 0.1 rev
$0.60\pi =$ ☐ 🔧 0.3 rev
$1.6\pi =$ ☐ 🔧 0.8 rev
$8\pi =$ ☐ 🔧 4 rev

Supporting Materials

Physical Constants

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2. Question Details   OSColPhys1 6.P.005.WA. [2611552]

A bicycle tire of radius 0.42 m has a piece of gum stuck on its rim. What is the angle through which the tire rotates when the gum has moved through a linear distance of 1.84 m? Express your answer in radians and degrees.

☐ 🔧 4.38 rad
☐ 🔧 251 °

Supporting Materials

Physical Constants

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3. Question Details   OSColPhys1 6.P.002.WA. [2611697]

An automobile with 0.320 m radius tires travels 80,000 km before wearing them out. How many revolutions do the tires make, neglecting any backing up and any change in radius due to wear?

☐ 🔧 3.98e+07 rev

Supporting Materials

Physical Constants

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4. Question Details   OSColPhys1 6.P.004.WA. [2611605]

A truck with 0.385 m radius tires travels at 44.5 m/s. At how many radians per second are the tires rotating?

☐ 🔧 116 rad/s

What is this value in rpm?

☐ 🔧 1100 rpm

Supporting Materials

Physical Constants

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5. Question Details   OSColPhys1 6.P.007.WA. [2611557]

Mary and her younger brother Alex decide to ride the 17-foot-diameter carousel at the State Fair. Mary sits on one of the horses in the outer section at a distance of 8 feet from the center. Alex decides to play it safe and chooses to sit in the inner section at a distance of 5 feet from the center.

(a) What is Mary's angular speed ω_M compared to that of Alex's angular speed ω_A? Give your answer as a multiple of ω_A.

$\omega_M =$ ☐ 🔧 1 ω_A

(b) What is Mary's tangential speed v_M compared to that of Alex's tangential speed v_A? Give your answer as a multiple of v_A.

$v_M =$ ☐ 🔧 1.6 v_A

Supporting Materials

Physical Constants

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6. Question Details   OSColPhys1 3.P.001.WA. [2439400]

The length of the slope of a mountain is 2660 m, and it makes an angle of 13.7° with the horizontal. What is the height of the mountain, relative to its base?

☐ 🔧 630 m

Supporting Materials

Physical Constants

7.   Question Details   OSColPhys1 3.P.002.WA. [2439412]

A cheetah is running at a speed of 20.4 m/s in a direction of 43° north of west. Find the components of the cheetah's velocity along the following directions.

(a) the velocity component due north

[   ] 🔍 13.9 m/s

(b) the velocity component due west

[   ] 🔍 14.9 m/s

Supporting Materials

Physical Constants

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8.   Question Details   OSColPhys1 3.P.027.WA. [2439388]

Two position vectors, $\vec{A}$ and $\vec{B}$, are shown in the diagram below. The green arrow represents vector $\vec{A}$ while the red one represents $\vec{B}$. The components of the vectors are as follows:
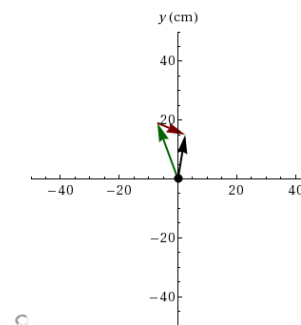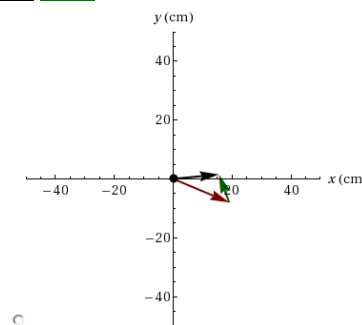
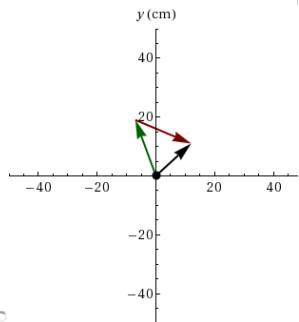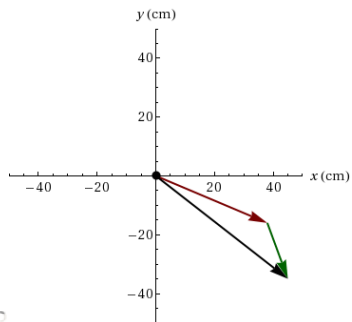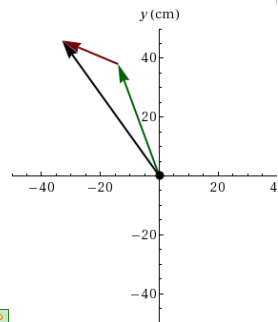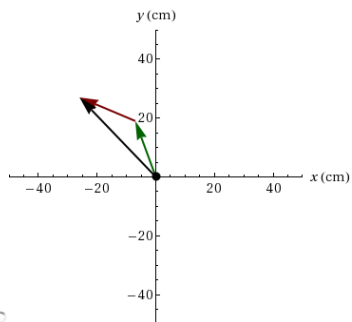$A_x = -7$ cm, $A_y = 19$ cm
$B_x = 19$ cm, $B_y = -8$ cm.
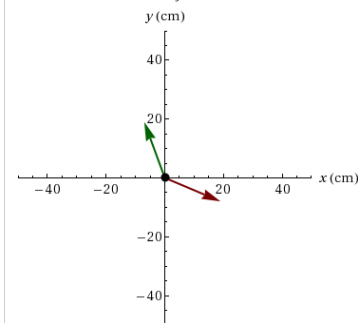
For each of the given expressions, calculate the magnitude of the resultant vector, and select the diagram that is the best graphical (tail-to-head method) representation of the vectors and the resultant.

(a) $\vec{C} = \vec{A} + \vec{B}$

[   ] 🔍 16.3 cm

(b) $\vec{D} = 2\vec{A} - \vec{B}$

[56.6] cm

Supporting Materials

Physical Constants

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9.   Question Details   OSColPhys1 3.P.014.WA. [2439397]

While in a park, you walk west for 52 m, then you walk 32.1° north of west for 41 m, and finally you walk due north for 25 m. Find the components of your final displacement, from your initial to final point, along the north and west directions.

(a) displacement component due north

[46.8] m

(b) displacement component due west

[86.7] m

Supporting Materials

Physical Constants

10.   Question Details   OSColPhys1 3.3.020. [2153316]

A new landowner has a triangular piece of flat land she wishes to fence. Starting at the west corner, she measures the first side to be 80 m long and the next to be 105 m -- these sides are represented as displacement vectors **A** and **B** in Figure 3.26, where θ_1=23°, and θ_2=13°. She then correctly calculates the length and orientation of the third side **C**. What is her result?
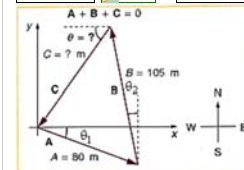
[86.9] m   [54.9] ° south of west

Figure 3.26.

Assignment Details

Name (AID): **Week 6 Problem Set (5398482)**
Submissions Allowed: **5**
Category: **Homework**
Code:
Locked: **No**
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