CENGAGE | WEBASSIGN

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(sign out)

12.2 Vectores (Homework)

INSTRUCTOR
Christiaan Ketelaar
Universidad Francisco Marroquin

Current Score

QUESTION	1	2	3	4	5	6	7	8	9	10	11	12	13
POINTS	2/2 ✓	2/2 ✓	2/2 ✓	2/2 ✓	2/2 ✓	2/2 ✓	2/2 ✓	2/2 ✓	2/2 ✓	2/0 ★	2/2 ✓	1.5/0 ★	2/2 ✓

TOTAL SCORE

25.5/22 115.9%

Due Date Past Due

SAT, APR 4, 2020
11:59 PM CST

Request Extension

Assignment Submission & Scoring

Assignment Submission

For this assignment, you submit answers by question parts. The number of submissions remaining for each question part only changes if you submit or change the answer.

Assignment Scoring

Your last submission is used for your score.

The due date for this assignment has passed.

Your work can be viewed below, but no changes can be made.

Important! Before you view the answer key, decide whether or not you plan to request an extension. Your Instructor may not grant you an extension if you have viewed the answer key. Automatic extensions are not granted if you have viewed

the answer key.

Request Extension

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1. 2/2 POINTS | PREVIOUS ANSWERS | **SCALC8 12.2.001.** | MY NOTES | ASK YOUR TEACHER

Are the following quantities vectors or scalars? Explain.

(a) The cost of a theater ticket

The cost of a theater ticket is a [scalar] ✓ because it has [only magnitude] ✓ .

(b) The current in a river

The current in a river is a [vector] ✓ because it has [both magnitude and direction] ✓ .

(c) The initial flight path from Houston to Dallas

The initial flight path from Houston to Dallas is a [vector] ✓ because it has [both magnitude and direction] ✓ .

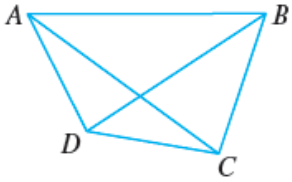
(d) The population of the world

The population of the world is a [scalar] ✓ because it has [only magnitude] ✓ .

Need Help? Read It | Watch It | Talk to a Tutor

2. 2/2 POINTS | PREVIOUS ANSWERS | SCALC8 12.2.004. | MY NOTES | ASK YOUR TEACHER

Write each combination of vectors as a single vector.



(a) $\overrightarrow{AB} + \overrightarrow{BC}$

$$\rightarrow AC$$

(b) $\overrightarrow{CD} + \overrightarrow{DB}$

$$\rightarrow CB$$

(c) $\overrightarrow{DB} - \overrightarrow{AB}$

$$\rightarrow DA$$

(d) $\overrightarrow{DC} + \overrightarrow{CA} + \overrightarrow{AB}$

$$\rightarrow DB$$

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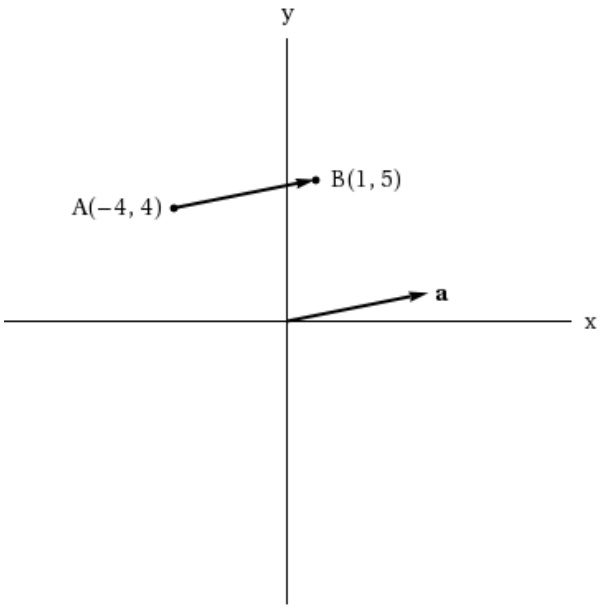
3. 2/2 POINTS | PREVIOUS ANSWERS | SCALC8 12.2.501.XP. | MY NOTES | ASK YOUR TEACHER

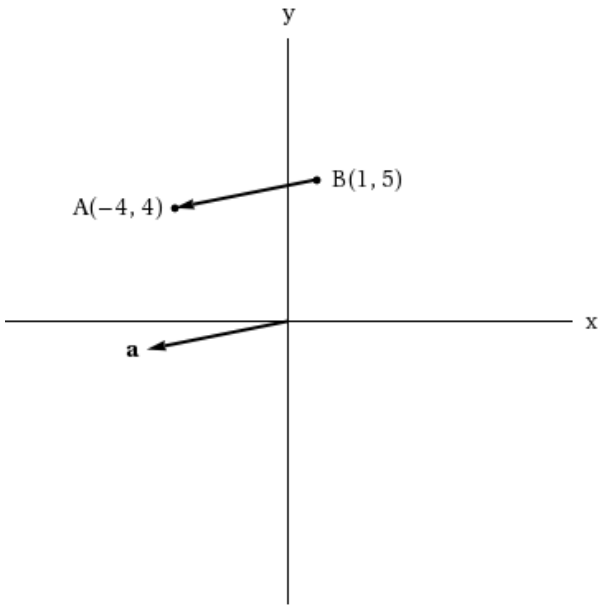
Find a vector **a** with representation given by the directed line segment $\overrightarrow{AB}$.

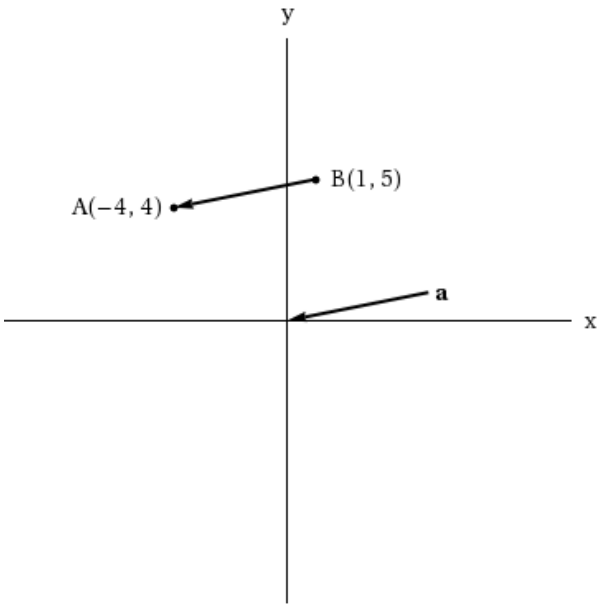
$A(-4, 4)$, $B(1, 5)$

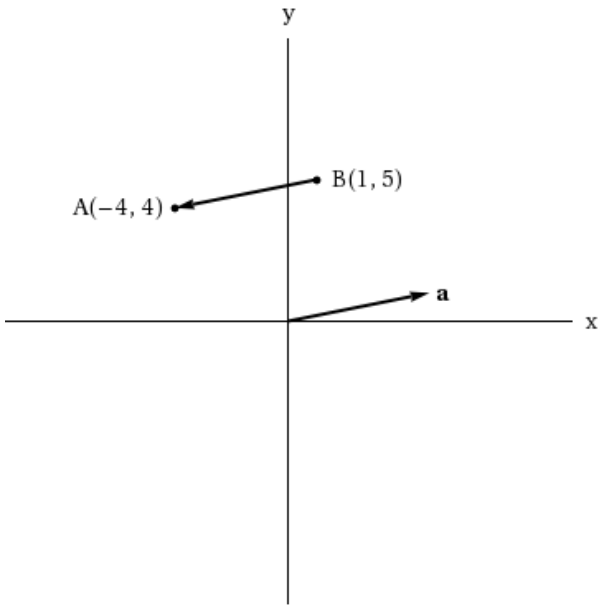
$$5i+j

Draw $\overrightarrow{AB}$ and the equivalent representation starting at the origin.









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4. 2/2 POINTS | PREVIOUS ANSWERS | SCALC8 12.2.015. | MY NOTES | ASK YOUR TEACHER

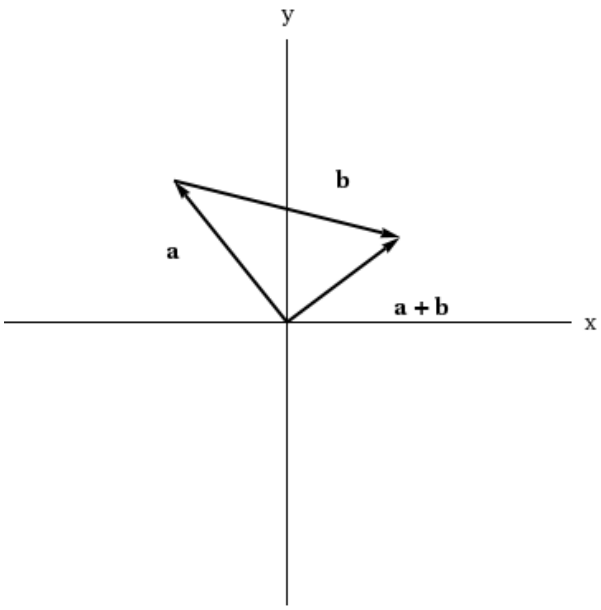
Find the sum of the given vectors.

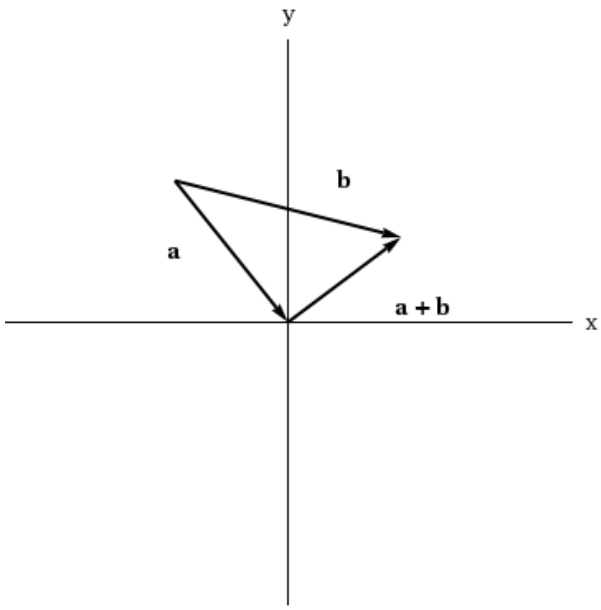
$\mathbf{a} = \langle -4, 5 \rangle, \quad \mathbf{b} = \langle 8, -2 \rangle$

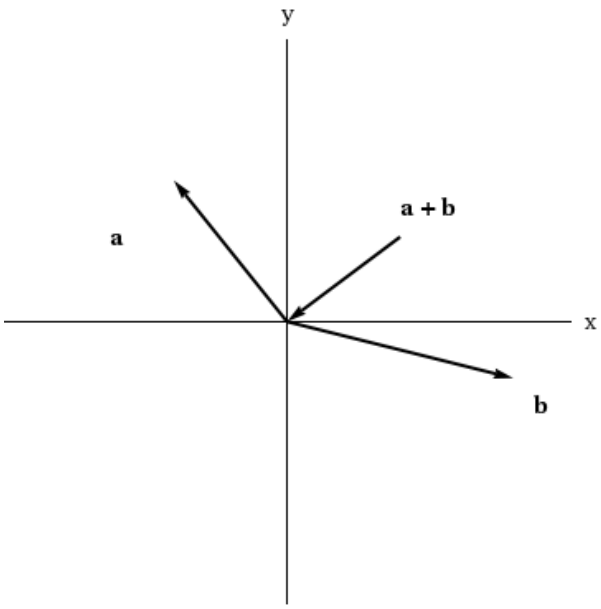
$\mathbf{a} + \mathbf{b} =$

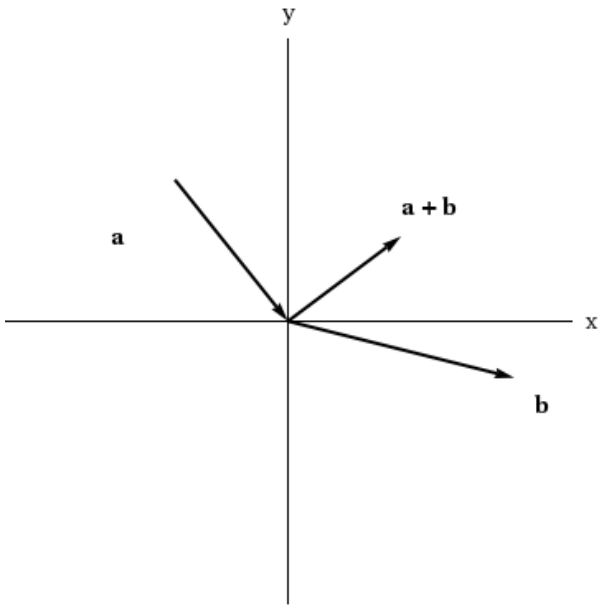
$$\langle 4,3 \rangle

Illustrate geometrically.









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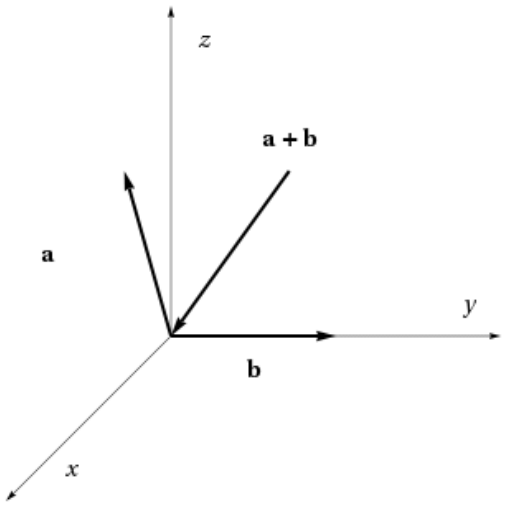
5. 2/2 POINTS | PREVIOUS ANSWERS | SCALC8 12.2.017. | MY NOTES | ASK YOUR TEACHER

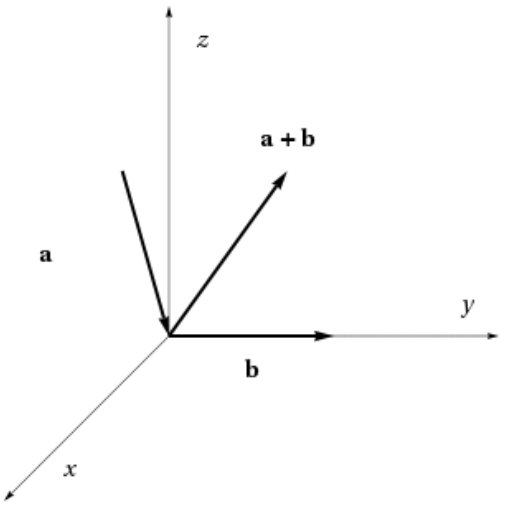
Find the sum of the given vectors.

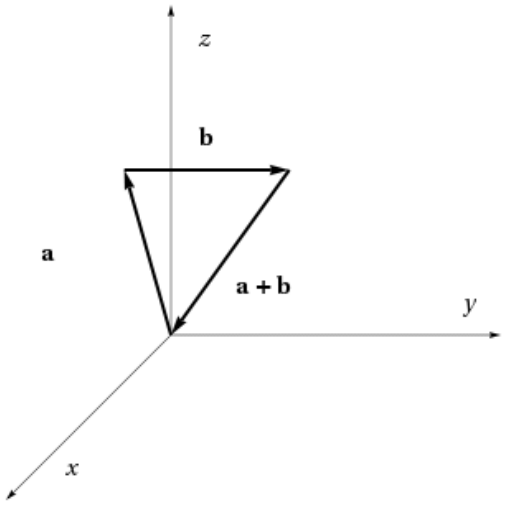
$\mathbf{a} = \langle 2, 0, 5 \rangle, \quad \mathbf{b} = \langle 0, 5, 0 \rangle$

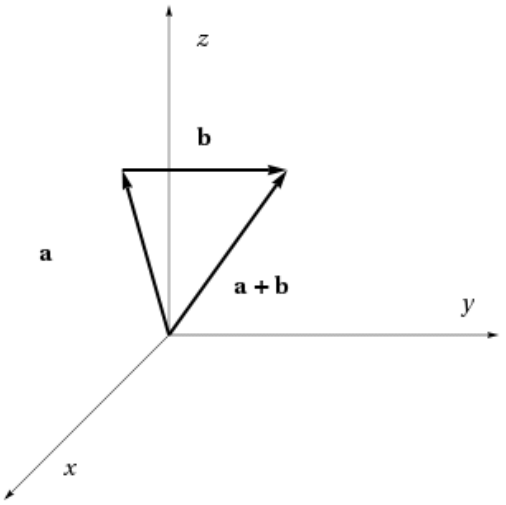
a + **b** =
$$\langle 2,5,5 \rangle$$

Illustrate geometrically.









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6. 2/2 POINTS | PREVIOUS ANSWERS | SCALC8 12.2.019. | MY NOTES | ASK YOUR TEACHER

Find $\mathbf{a} + \mathbf{b}$, $6\mathbf{a} + 8\mathbf{b}$, $|\mathbf{a}|$, and $|\mathbf{a} - \mathbf{b}|$. (Simplify your answer completely.)

$\mathbf{a} = \langle -3, 4 \rangle$, $\mathbf{b} = \langle 9, -1 \rangle$

$\mathbf{a} + \mathbf{b} =$ $$(6,3)

$6\mathbf{a} + 8\mathbf{b} =$ $$(54,16)

$|\mathbf{a}| =$ $$5

$|\mathbf{a} - \mathbf{b}| =$ $$13

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7. 2/2 POINTS | PREVIOUS ANSWERS | SCALC8 12.2.024. | MY NOTES | ASK YOUR TEACHER

Find a unit vector that has the same direction as the given vector.

$-6\mathbf{i} + 4\mathbf{j} - \mathbf{k}$

$$-6\sqrt{53}i+4\sqrt{53}j-1\sqrt{53}k

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8. 2/2 POINTS | PREVIOUS ANSWERS | SCALC8 12.2.030.MI.SA. | MY NOTES | ASK YOUR TEACHER

This question has several parts that must be completed sequentially. If you skip a part of the question, you will not receive any points for the skipped part, and you will not be able to come back to the skipped part.

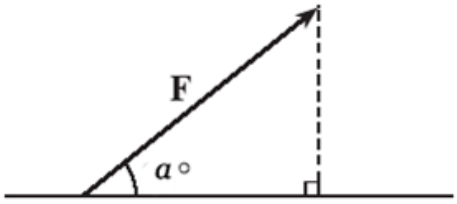
Tutorial Exercise

If a child pulls a sled through the snow on a level path with a force of 80 N exerted at an angle of 41° above the horizontal, find the horizontal and vertical components of the force.

Step 1

We are given that a force of 80 N is exerted at an angle of 41°. Therefore, the force vector **F** can be represented as the hypotenuse of a right triangle with an acute angle 41°. The length of the hypotenuse would be |**F**| = 80 ✓ .

This is illustrated as follows, with $a°$ = 41°.



Step 2

Since the hypotenuse has length 80, then the side adjacent to the 41° angle is given by

$x = \left(80 \right.$ $$cos(41°)

✓).

Step 3

Since the hypotenuse has length 80, then the side opposite to the 41° angle is given by

$y = \left(80 \right.$ $$sin(41°)

✓).

Step 4

So, rounding to one decimal place, the horizontal and vertical components of the force are as follows.

horizontal	60.4 ✓	N
vertical	52.5 ✓	N

You have now completed the Master It.

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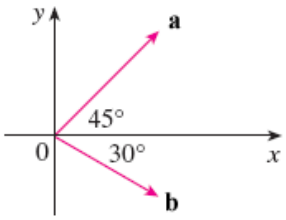
9. 2/2 POINTS | PREVIOUS ANSWERS | SCALC8 12.2.032. | MY NOTES | ASK YOUR TEACHER

Find the magnitude of the resultant force and the angle it makes with the positive x-axis. (Let $|\mathbf{a}| = 22$ lb and $|\mathbf{b}| = 18$ lb. Round your answers to one decimal place.)

magnitude 31.82 ✓ lb

angle 11.9 ✓ °



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10. 2/0 POINTS | PREVIOUS ANSWERS | SCALC8 12.2.037. | MY NOTES | ASK YOUR TEACHER

A block-and-tackle pulley hoist is suspended in a warehouse by ropes of lengths 2 m and 3 m. The hoist weighs 410 N. The ropes, fastened at different heights, make angles of 50° and 38° with the horizontal. Find the tension in each rope and the magnitude of each tension. (Let $\mathbf{T}_2$ and $\mathbf{T}_3$, represent the tension vectors corresponding to the ropes of length 2 m and 3 m respectively. Round all numerical values to two decimal places.)

$$-207.80i+247.65j

$\mathbf{T}_2$ =

✓

$$323.28

$|\mathbf{T}_2|$ =

✓ N

$$207.798i+162.35j

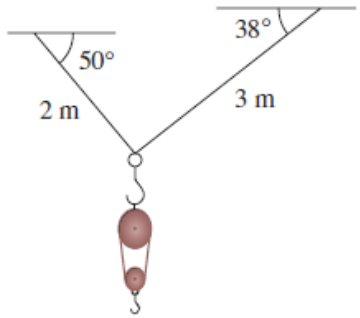
$\mathbf{T}_3$ =

✓

$$263.70

$|\mathbf{T}_3|$ =

✓ N



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11. 2/2 POINTS | PREVIOUS ANSWERS | SCALC8 12.2.038. | MY NOTES | ASK YOUR TEACHER

The tension **T** at each end of the chain has magnitude 25 N (see the figure). What is the weight of the chain? (Round your answer to two decimal places.)

30.09 ✔ N

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12. 1.5/0 POINTS | PREVIOUS ANSWERS | **SCALC8 12.2.042.** | MY NOTES | ASK YOUR TEACHER

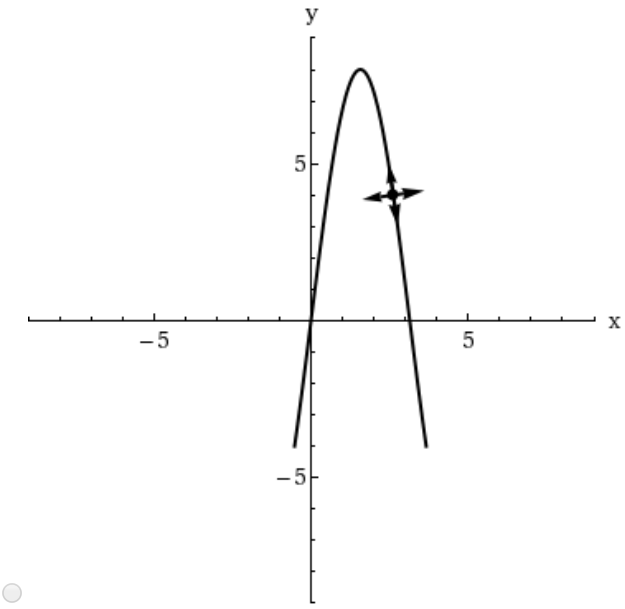
(a) Find the unit vectors that are parallel to the tangent line to the curve $y = 8\sin(x)$ at the point $(\pi/6, 4)$. (Enter your answer as a comma-separated list of vectors.)

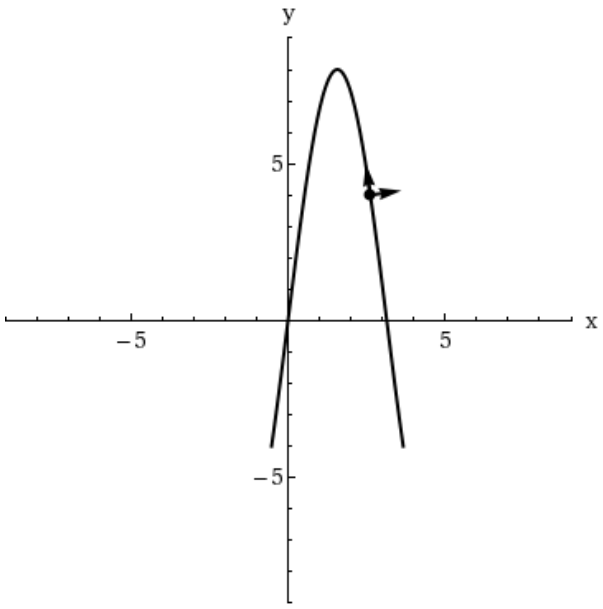
$$\langle 17, 4\sqrt{37} \rangle, \langle -17, -4\sqrt{37} \rangle$$

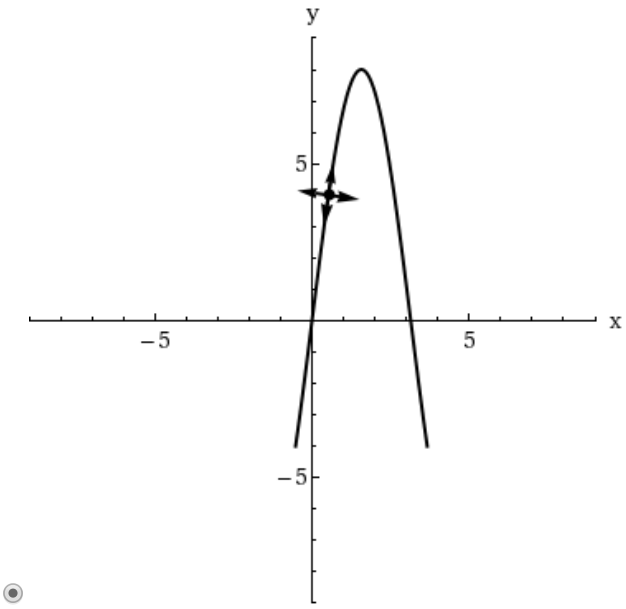
(b) Find the unit vectors that are perpendicular to the tangent line.

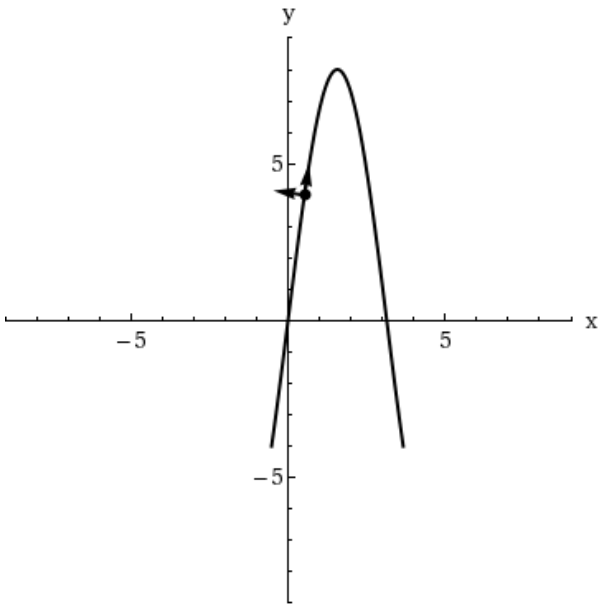
$$\langle 4\sqrt{37}, -17 \rangle, \langle -4\sqrt{37}, 17 \rangle$$

(c) Sketch the curve $y = 8\sin(x)$ and the vectors in parts (a) and (b), all starting at $(\pi/6, 4)$.









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13. 2/2 POINTS | PREVIOUS ANSWERS | SCALC8 12.2.JIT.003. | MY NOTES | ASK YOUR TEACHER

A pair of points is given.

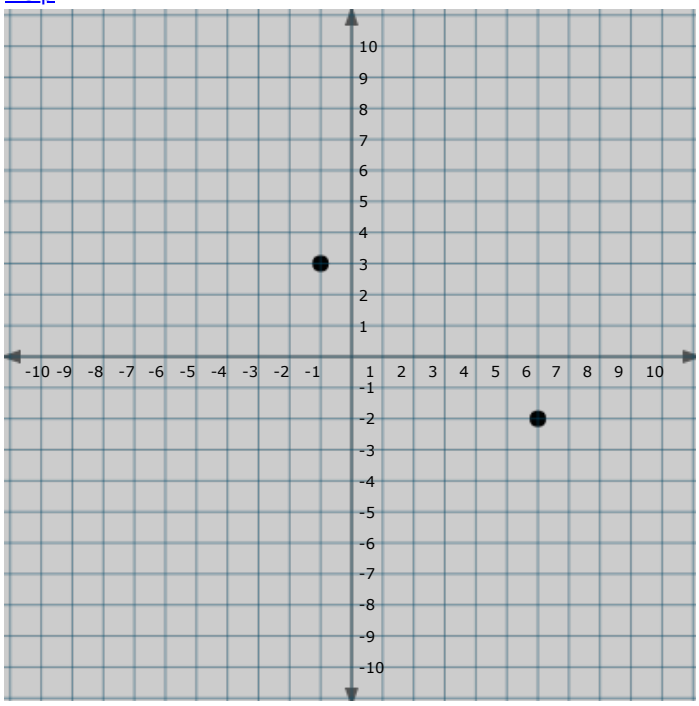
(6, −2), (−1, 3)

(a) Plot the points in a coordinate plane.

- Selection Tool
- Line
- Ray
- Segment
- Circle
- Vertical Parabola
- Horizontal Parabola
- Point

No Solution

Help



Clear Graph

Delete Layer

Fill

WebAssign Graphing Tool

Graph LayersToggle Open/Closed

- Point 1
  Remove This Layer
  P1 (6, -2)
- Point 2
  Remove This Layer
  P1 (-1, 3)

Submission Data

(b) Find the distance between them.
$$√74

(c) Find the midpoint of the segment that joins them.
$(x, y) = (5/2,1/2)$

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