

Trig 8.3

Add and subtract vectors in 3-D space  
Find the magnitude of vectors in 3-D

$x, y, z$

Quiz 8.1-8.2 (Thurs.)

vector

$(x, y, z)$

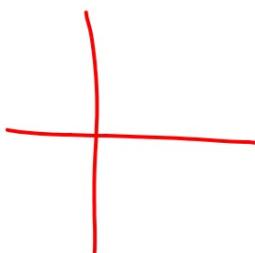
magnitude

$(10, 18, 24)$

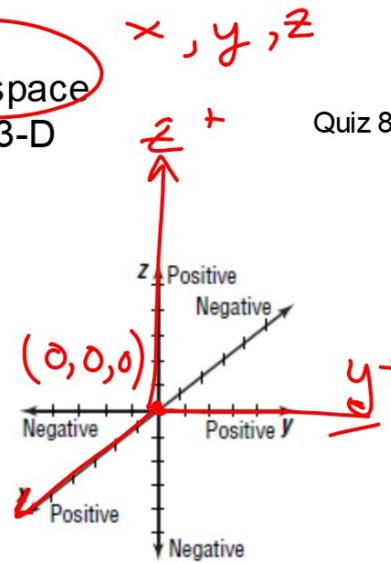
x-axis

y-axis

z-axis



$x^+$



Octants

Hard to draw :(  
model with floor graphs...

ordered pair

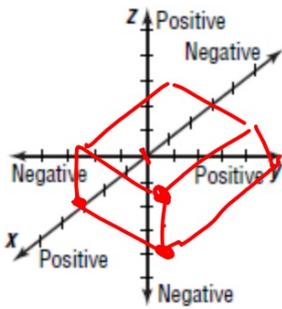
ordered triple

component form

unit vectors  $i, j, k$

Floor graph Unit = feet (for now)

1 Locate the point at  $\overset{x\ y}{\boxed{3, 5, 2}}$



We will do the math, not spend a lot of time trying to sketch. May interpret drawings made by others (book, WS).  
Model this one (floor graph) units are feet

2 Write the ordered triple that represents the vector from  $X(5, 3, 2)$  to  $Y(4, 3, 6)$

$(-1, 2, 4)$

$x \rightarrow y$

What are changes to x-coord?

y-coord?

z-coord?

2 Write the ordered triple that represents the vector from  $X(5, -3, 2)$  to  $Y(4, -5, 6)$

$\vec{xy}$

$$(-1, -2, 4)$$

4 Find an ordered triple that represents  $3\bar{p} - 2\bar{q}$  if  $\bar{p} = \langle 3, 0, 4 \rangle$  and  $\bar{q} = \langle 2, 1, -1 \rangle$ .

$$3 \langle 3, 0, 4 \rangle + 2 \langle 2, 1, -1 \rangle$$

$$\langle 9, 0, 12 \rangle + \langle -4, -2, 2 \rangle$$

$$\langle 5, -2, 4 \rangle$$

$$12^2 + 8^2 + 6^2 =$$

<vector>

$\overline{RS}$

$|\overrightarrow{RS}|$

Write the ordered triple that represents  $\overline{RS}$ . Then find the magnitude of  $\overline{RS}$ .

5.  $R(-2, 5, 8), S(3, 9, -3)$

6.  $R(3, 7, -1), S(10, -4, 0)$

$\langle 5, 4, -11 \rangle$

$\langle 7, -11, 1 \rangle$

$7^2 + 11^2 + 1^2 =$

What is initial point? Terminal point?

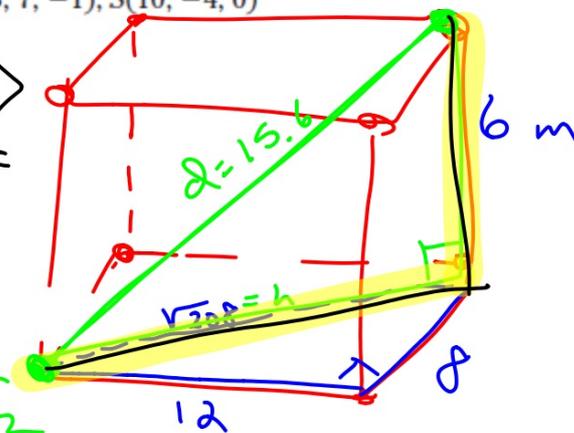
$5\vec{i} + 4\vec{j} - 11\vec{k}$      13, 1

$5^2 + 4^2 + 11^2 = d^2$

$162 = d^2$

$12.7 \approx d$

$208 + 36 = d^2$   
 $244 = d^2$   
 $15.6$



$i, j, k$

How far is it? Which direction?

**5** Write  $\overline{AB}$  as the sum of unit vectors for  $A(5, 10, -3)$  and  $B(-1, 4, -2)$ .

13-330

final - initial...just like odometer on your car

Write  $\overline{EF}$  as the sum of unit vectors.

9.  $E(-5, -2, 4), F(6, -6, 6)$

10.  $E(-12, 15, -9), F(-12, 17, -22)$

These are already vectors. (How do we know?)

Find an ordered triple to represent  $\vec{a}$  in each equation if  $\vec{f} = \langle 1, -3, -8 \rangle$  and  $\vec{g} = \langle 3, 9, -1 \rangle$ .

7.  $\vec{a} = 3\vec{f} + \vec{g}$

8.  $\vec{a} = 2\vec{g} - 5\vec{f}$