

Anageom tutorial

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Start Anageom

Press “diamond” and “3”.



ANAGEOM RAD AUTO FUNC 0/30

New problem

Press F8 and choose Problem, new.



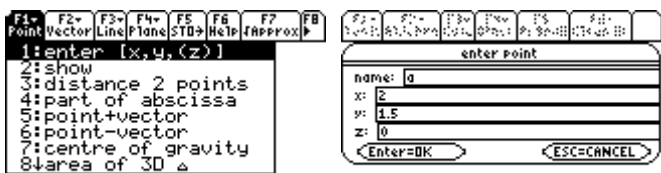
ANAGEOM RAD AUTO FUNC 0/30

Now all old variables are deleted and we can start our new problem.

We want to enter these points:

- A [2; 1.5; 0]
- B [4; 0.5; 0]
- C [0; -5; 3]
- D [2; -1; 1]

Press F1 and Enter. Then enter point A.



TYPE OR USE ←→+ + [ENTER] OR [ESC] ANAGEOM RAD AUTO FUNC 0/30

Press Enter.



ANAGEOM RAD AUTO FUNC PAUSE

Now we are in pause mode. If the result is big, we can scroll the screen by left and right arrow. Press enter to leave the pause mode.

Ok. Now enter points B, C and D.

```

F1 Point F2 Vector F3 Line F4 Plane F5 STD Help F7 F8
A[2.;1.5;0.]
B[4.;.5;0.]
C[0.;-5.;3.]
D[2.;-1.;1.]

```

ANAGEDM RAD AUTO FUNC 0/30

If you have entered some point wrong, enter it again, it will overwrite.

What is distance between A and B?

Press F1, 3, ab, ENTER twice and once more ENTER to leave the pause mode.

```

F1 Point F2 Vector F3 Line F4 Plane F5 STD Help F7 F8
1:enter [x,y,(z)]
2:show
3:distance 2 points
4:part of abscissa
5:point+vector
6:point-vector
7:centre of gravity
8:area of 3D

```

```

A[2.;1.5;0.]
distance 2 points
2 points: ab
<Enter=OK> <ESC=CANCEL>

```

```

A[2.;1.5;0.]
B[4.;.5;0.]
C[0.;-5.;3.]
D[2.;-1.;1.]
|AB| = 2.23607

```

ANAGEDM RAD AUTO FUNC 0/30 ANAGEDM RAD AUTO FUNC 0/30 ANAGEDM RAD AUTO FUNC 0/30

The distance is 2.23. I will be more brief in next questions so just follow screenshots.

What is point just in half between A and B?

```

F1 Point F2 Vector F3 Line F4 Plane F5 STD Help F7 F8
1:enter [x,y,(z)]
2:show
3:distance 2 points
4:part of abscissa
5:point+vector
6:point-vector
7:centre of gravity
8:area of 3D

```

```

A[2.;1.5;0.]
part of abscissa
2 points: ab
part: 1/2
<Enter=OK> <ESC=CANCEL>

```

```

A[2.;1.5;0.]
B[4.;.5;0.]
C[0.;-5.;3.]
D[2.;-1.;1.]
|AB| = 2.23607
1/2 AB = [3.;1.;0.]

```

ANAGEDM RAD AUTO FUNC 0/30 ANAGEDM RAD AUTO FUNC 0/30 ANAGEDM RAD AUTO FUNC 0/30

What is point in one third between A and B?

```

F1 Point F2 Vector F3 Line F4 Plane F5 STD Help F7 F8
1:enter [x,y,(z)]
2:show
3:distance 2 points
4:part of abscissa
5:point+vector
6:point-vector
7:centre of gravity
8:area of 3D

```

```

A[2.;1.5;0.]
part of abscissa
2 points: ab
part: 1/3
<Enter=OK> <ESC=CANCEL>

```

```

A[2.;1.5;0.]
B[4.;.5;0.]
C[0.;-5.;3.]
D[2.;-1.;1.]
|AB| = 2.23607
1/2 AB = [3.;1.;0.]
1/3 AB = [2.66667;1.16667;0.]

```

ANAGEDM RAD AUTO FUNC 0/30 ANAGEDM RAD AUTO FUNC 0/30 ANAGEDM RAD AUTO FUNC 0/30

We can scroll and then press ENTER.

```

F1 Point F2 Vector F3 Line F4 Plane F5 STD Help F7 F8
A[2.;1.5;0.]
B[4.;.5;0.]
C[0.;-5.;3.]
D[2.;-1.;1.]
|AB| = 2.23607
1/2 AB = [3.;1.;0.]
1/3 AB = [2.66667;1.16667;0.]

```

ANAGEDM RAD AUTO FUNC 0/30

What is vector between A and B?

```

F1- F2- F3- F4- F5- F6- F7- F8-
Point Vector Line Plane STD Help FApprox FB
D12: 1:enter (x,y,(z))
B14: 2:enter (2 points)
C10: 3:show
D12: 4:size
IAB: 5:vector+vector
1/2 AB: 6:vector-vector
AB: 7:vector*vector (sc)
1/2 AB: 8:vector*vector
AB = [2.66667;1.16667;0.]
ANAGEOM RAD AUTO FUNC 0/30
  
```

```

F1- F2- F3- F4- F5- F6- F7- F8-
Point Vector Line Plane STD Help FApprox FB
D12: 1:enter (x,y,(z))
B14: 2:enter (2 points)
C10: 3:show
D12: 4:size
IAB: 5:vector+vector
1/2 AB: 6:vector-vector
AB: 7:vector*vector (sc)
1/2 AB: 8:vector*vector
AB = [2.66667;1.16667;0.]
ANAGEOM RAD AUTO FUNC 0/30
  
```

```

F1- F2- F3- F4- F5- F6- F7- F8-
Point Vector Line Plane STD Help FApprox FB
D12: 1:enter (x,y,(z))
B14: 2:enter (2 points)
C10: 3:show
D12: 4:size
IAB: 5:vector+vector
1/2 AB: 6:vector-vector
AB: 7:vector*vector (sc)
1/2 AB: 8:vector*vector
AB = [2.66667;1.16667;0.]
ANAGEOM RAD AUTO FUNC 0/30
  
```

What is angle between AB and CD?

We can do this in two ways – by vectors or by lines.

```

F1- F2- F3- F4- F5- F6- F7- F8-
Point Vector Line Plane STD Help FApprox FB
D12: 1:enter (x,y,(z))
B14: 2:enter (2 points)
C10: 3:show
D12: 4:size
IAB: 5:vector+vector
1/2 AB: 6:vector-vector
AB: 7:vector*vector (sc)
1/2 AB: 8:vector*vector
AB = [2.66667;1.16667;0.]
ANAGEOM RAD AUTO FUNC 0/30
  
```

```

F1- F2- F3- F4- F5- F6- F7- F8-
Point Vector Line Plane STD Help FApprox FB
D12: 1:enter (x,y,(z))
B14: 2:enter (2 points)
C10: 3:show
D12: 4:size
IAB: 5:vector+vector
1/2 AB: 6:vector-vector
AB: 7:vector*vector (sc)
1/2 AB: 8:vector*vector
AB = [2.66667;1.16667;0.]
ANAGEOM RAD AUTO FUNC 0/30
  
```

```

F1- F2- F3- F4- F5- F6- F7- F8-
Point Vector Line Plane STD Help FApprox FB
D12: 1:enter (x,y,(z))
B14: 2:enter (2 points)
C10: 3:show
D12: 4:size
IAB: 5:vector+vector
1/2 AB: 6:vector-vector
AB: 7:vector*vector (sc)
1/2 AB: 8:vector*vector
AB = [2.66667;1.16667;0.]
ANAGEOM RAD AUTO FUNC 0/30
  
```

```

F1- F2- F3- F4- F5- F6- F7- F8-
Point Vector Line Plane STD Help FApprox FB
D12: 1:enter (x,y,(z))
B14: 2:enter (2 points)
C10: 3:show
D12: 4:size
IAB: 5:vector+vector
1/2 AB: 6:vector-vector
AB: 7:vector*vector (sc)
1/2 AB: 8:vector*vector
AB = [2.66667;1.16667;0.]
ANAGEOM RAD AUTO FUNC 0/30
  
```

```

F1- F2- F3- F4- F5- F6- F7- F8-
Point Vector Line Plane STD Help FApprox FB
D12: 1:enter (x,y,(z))
B14: 2:enter (2 points)
C10: 3:show
D12: 4:size
IAB: 5:vector+vector
1/2 AB: 6:vector-vector
AB: 7:vector*vector (sc)
1/2 AB: 8:vector*vector
AB = [2.66667;1.16667;0.]
ANAGEOM RAD AUTO FUNC 0/30
  
```

If we do not like result in radians, we can exit Anageom and set degree mode and run Anageom again – it remembers all variables. To access Exit menu, press F8.

```

F1- F2- F3- F4-
Problem Language Exit
D12: 1:enter (x,y,(z))
IAB: 5:vector+vector
1/2 AB: 6:vector-vector
AB: 7:vector*vector (sc)
1/2 AB: 8:vector*vector
AB = [2.66667;1.16667;0.]
ANAGEOM RAD AUTO FUNC 0/30
  
```

Press MODE and set degrees mode.

```

MODE
F1- F2- F3-
Page 1 Page 2 Page 3
Graph..... FUNCTION →
Current Folder..... main →
Display Digits..... FLOAT 6 →
Angle..... 1: RADIAN
Exponential Format.....
Complex Format.....
Vector Format..... RECTANGULAR →
Pretty Print..... ON →
<Enter>=SAVE <ESC>=CANCEL
TYPE OR USE <+>+ <ENTER> OR <ESC>
  
```

Run Anageom again – press “diamond” and “3”.

```

F1- F2- F3- F4- F5- F6- F7- F8-
Point Vector Line Plane STD Help FApprox FB
D12: 1:enter (x,y,(z))
IAB: 5:vector+vector
1/2 AB: 6:vector-vector
AB: 7:vector*vector (sc)
1/2 AB: 8:vector*vector
AB = [2.66667;1.16667;0.]
ANAGEOM DEG AUTO FUNC 0/30
  
```

Now we calculate angle again, exactly same way as before.

```

F1- F2- F3- F4- F5- F6- F7- FB
Point Vector Line Plane STD Help FApprox
DTZ 5:vector+vector
1AB 6:vector-vector
1/2 7:vector*vector (sc)
1/3 8:vector*vector
1/3 9:vector*number
AB A:vector+size
AB B:variance
AB C:rotation
↔AB ↔↔CD = 1.5708°
ANAGEDM DEGAUTO FUNC 0/30
  
```

```

F1- F2- F3- F4- F5- F6- F7- FB
Point Vector Line Plane STD Help FApprox
DTZ 3: 1.; 1.; 1.
vector:vector
vector: ab
vector: cd
Enter=OK ESC=CANCEL
↔AB ↔↔CD = 1.5708°
↔AB ↔↔CD = 1.5708°
ANAGEDM DEGAUTO FUNC 0/30
  
```

```

F1- F2- F3- F4- F5- F6- F7- FB
Point Vector Line Plane STD Help FApprox
TMB1 = 2.23607
1/2 AB = [3.; 1.; 0.]
1/3 AB = [2.66667; 1.16667; 0]
AB = (2.; -1.; 0.)
↔AB ↔↔CD = 1.5708°
↔AB ↔↔CD = 1.5708°
↔AB ↔↔CD = 90.°
ANAGEDM DEGAUTO FUNC 0/30
  
```

Nice. It seems that both lines are perpendicular.

Calculate scalar product of AB and CD.

```

F1- F2- F3- F4- F5- F6- F7- FB
Point Vector Line Plane STD Help FApprox
TMB 1:enter (x,y,(z))
1/2 2:enter (2 points)
1/3 3:show
1/3 4:size
AB 5:vector+vector
AB 6:vector-vector
AB 7:vector*vector (sc)
↔AB ↔↔CD = 90.°
ANAGEDM DEGAUTO FUNC 0/30
  
```

```

F1- F2- F3- F4- F5- F6- F7- FB
Point Vector Line Plane STD Help FApprox
1/2 MB = [3.; 1.; 0.]
1/3 AB = [2.66667; 1.16667; 0]
AB = (2.; -1.; 0.)
AB ↔↔CD = 1.5708°
↔AB ↔↔CD = 1.5708°
↔AB ↔↔CD = 90.°
AB *(sc) ↔CD = 0.
ANAGEDM DEGAUTO FUNC 0/30
  
```

It is 0. So they are perpendicular.

Calculate vector product between AB and CD and store it as vector c.

```

F1- F2- F3- F4- F5- F6- F7- FB
Point Vector Line Plane STD Help FApprox
1/2 1:enter (x,y,(z))
1/3 2:enter (2 points)
AB 3:show
AB 4:size
AB 5:vector+vector
AB 6:vector-vector
AB 7:vector*vector (sc)
AB 8:vector*vector
↔AB ↔↔CD = 0.
ANAGEDM DEGAUTO FUNC 0/30
  
```

```

F1- F2- F3- F4- F5- F6- F7- FB
Point Vector Line Plane STD Help FApprox
1/2 MB = [3.; 1.; 0.]
1/3 AB = [2.66667; 1.16667; 0]
AB = (2.; -1.; 0.)
AB ↔↔CD = 1.5708°
↔AB ↔↔CD = 1.5708°
↔AB ↔↔CD = 90.°
AB *(sc) ↔CD = 0.
ANAGEDM DEGAUTO FUNC 0/30
  
```

```

F1- F2- F3- F4- F5- F6- F7- FB
Point Vector Line Plane STD Help FApprox
1/2 MB = [3.; 1.; 0.]
1/3 AB = [2.66667; 1.16667; 0]
AB = (2.; -1.; 0.)
AB ↔↔CD = 1.5708°
↔AB ↔↔CD = 1.5708°
↔AB ↔↔CD = 90.°
AB *(sc) ↔CD = 0.
AB × ↔CD = (2.; 4.; 10.)
↔c(2.; 4.; 10.)
ANAGEDM DEGAUTO FUNC 0/30
  
```

Press F5.

```

F1- F2- F3- F4- F5- F6- F7- FB
Point Vector Line Plane STD Help FApprox
1/3 MB = [2.66667; 1.16667; 0]
AB = (2.; -1.; 0.)
↔AB ↔↔CD = 1.5708°
↔AB ↔↔CD = 1.5708°
AB ↔↔CD = 90.°
AB *(sc) ↔CD = 0.
AB × ↔CD = (2.; 4.; 10.)
↔c(2.; 4.; 10.)
ANAGEDM DEGAUTO FUNC 0/30
  
```

```

F1- F2- F3- F4- F5- F6- F7- FB
Point Vector Line Plane STD Help FApprox
name of vector: c
Enter=OK ESC=CANCEL
↔AB ↔↔CD = 1.5708°
↔AB ↔↔CD = 1.5708°
AB ↔↔CD = 90.°
AB *(sc) ↔CD = 0.
AB × ↔CD = (2.; 4.; 10.)
↔c(2.; 4.; 10.)
ANAGEDM DEGAUTO FUNC 0/30
  
```

What is area of triangle ABC?

```

F1- F2- F3- F4- F5- F6- F7- FB
Point Vector Line Plane STD Help FApprox
1:enter (x,y,(z))
2:show
3:distance 2 points
4:part of abscissa
5:point+vector
6:point-vector
7:centre of gravity
8:area of 3D Δ
↔c(2.; 4.; 10.)
ANAGEDM DEGAUTO FUNC 0/30
  
```

```

F1- F2- F3- F4- F5- F6- F7- FB
Point Vector Line Plane STD Help FApprox
MB = [2.; 4.; 10.]
AB ↔↔CD = 1.5708°
↔AB ↔↔CD = 1.5708°
AB ↔↔CD = 90.°
AB *(sc) ↔CD = 0.
AB × ↔CD = (2.; 4.; 10.)
↔c(2.; 4.; 10.)
area ABC = 8.21584
ANAGEDM DEGAUTO FUNC 0/30
  
```

```

F1- F2- F3- F4- F5- F6- F7- FB
Point Vector Line Plane STD Help FApprox
3 points: abc
Enter=OK ESC=CANCEL
↔AB ↔↔CD = 1.5708°
↔AB ↔↔CD = 1.5708°
AB ↔↔CD = 90.°
AB *(sc) ↔CD = 0.
AB × ↔CD = (2.; 4.; 10.)
↔c(2.; 4.; 10.)
area ABC = 8.21584
ANAGEDM DEGAUTO FUNC 0/30
  
```

And what formula have you used to calculate it!?

Do not panic, we have got help ☺

Press F6.

```

F1- F2- F3- F4- F5-
Point Vector Line Plane Back
1:distance 2 points
2:part of abscissa
3:centre of gravity
4:area of 3D Δ
5:area of 2D polygon
AB × ↔CD = (2.; 4.; 10.)
↔c(2.; 4.; 10.)
area ABC = 8.21584
ANAGEDM DEGAUTO FUNC 0/30
  
```

```

F1- F2- F3- F4- F5-
Point Vector Line Plane Back
AB *(sc) ↔CD = 0.
AB × ↔CD = (2.; 4.; 10.)
↔c(2.; 4.; 10.)
area ABC = 8.21584
-----
ΔABC
area = 1/2 |AB × BC|
ANAGEDM DEGAUTO FUNC 0/30
  
```

And press F5.

```

F1+ Point Vector F2+ F3+ F4+ F5+ F6+ F7+ F8+
Vector Line Plane STD Help (Approx)
*CD = (2.;4.;10.)
→AB × →CD = (2.;4.;10.)
→c(2.;4.;10.)
area ABC = 8.21584
-----
ΔABC
area = 1/2 |→AB × →BC|
ANAGEDM DEGAUTO FUNC 0/30
  
```

What is a centre of gravity of triangle ABC?

| | | |
|---|--|---|
| <pre> F1+ Point Vector F2+ F3+ F4+ F5+ F6+ F7+ F8+ Vector Line Plane STD Help (Approx) 1:enter [x,y,(z)] 2:show 3:distance 2 points 4:part of abscissa 5:point+vector 6:point-vector 7:centre of gravity 8:area of 3D Δ ----- area = 1/2 →AB × →BC ANAGEDM DEGAUTO FUNC 0/30 </pre> | <pre> F1+ Point Vector F2+ F3+ F4+ F5+ F6+ F7+ F8+ Vector Line Plane STD Help (Approx) *CD = (2.;4.;10.) →AB × →CD = (2.;4.;10.) centre of gravity min 2 points: abc Enter=OK ESC=CANCEL ----- ΔABC area = 1/2 →AB × →BC centre of gr. ABC = [2.;-] ANAGEDM DEGAUTO FUNC 0/30 </pre> | <pre> F1+ Point Vector F2+ F3+ F4+ F5+ F6+ F7+ F8+ Vector Line Plane STD Help (Approx) *CD = (2.;4.;10.) →c(2.;4.;10.) area ABC = 8.21584 ----- ΔABC area = 1/2 →AB × →BC centre of gr. ABC = [2.;-] ANAGEDM DEGAUTO FUNC 0/30 </pre> |
|---|--|---|

We could scroll the result or save the result if we wanted.

Make line p from points A and B

| | | |
|---|---|---|
| <pre> F1+ Point Vector F2+ F3+ F4+ F5+ F6+ F7+ F8+ Vector Line Plane STD Help (Approx) 1:enter (2 points) 2:enter (point,vec.) 3:enter(universal)2D 4:enter(direction)2D 5:show 6:intersection 7:variance 8:line+vector ----- centre of gr. ABC = [2.;-] ANAGEDM DEGAUTO FUNC 0/30 </pre> | <pre> F1+ Point Vector F2+ F3+ F4+ F5+ F6+ F7+ F8+ Vector Line Plane STD Help (Approx) *CD = (2.;4.;10.) enter line - 2 points name: p 2 points: Enter=OK ESC=CANCEL ----- area = 1/2 →AB × →BC centre of gr. ABC = [2.;-] ANAGEDM DEGAUTO FUNC 0/30 </pre> | <pre> F1+ Point Vector F2+ F3+ F4+ F5+ F6+ F7+ F8+ Vector Line Plane STD Help (Approx) *CD = (2.;4.;10.) area ABC = 8.21584 ----- ΔABC area = 1/2 →AB × →BC centre of gr. ABC = [2.;-] →p = →AB = ([2.;1.5;0.] ANAGEDM DEGAUTO FUNC 0/30 </pre> |
|---|---|---|

What is distance between line p and point C?

| | | |
|--|--|--|
| <pre> F1+ Point Vector F2+ F3+ F4+ F5+ F6+ F7+ F8+ Vector Line Plane STD Help (Approx) 4:enter(direction)2D 5:show 6:intersection 7:variance 8:line+vector 9:point_line Hx → point By → point ----- →p = →AB = ([2.;1.5;0.] ANAGEDM DEGAUTO FUNC 0/30 </pre> | <pre> F1+ Point Vector F2+ F3+ F4+ F5+ F6+ F7+ F8+ Vector Line Plane STD Help (Approx) *CD = (2.;4.;10.) point line Point: c Line: p Enter=OK ESC=CANCEL ----- centre of gr. ABC = [2.;-] →p = →AB = ([2.;1.5;0.] ANAGEDM DEGAUTO FUNC 0/30 </pre> | <pre> F1+ Point Vector F2+ F3+ F4+ F5+ F6+ F7+ F8+ Vector Line Plane STD Help (Approx) *CD = (2.;4.;10.) area ABC = 8.21584 ----- ΔABC area = 1/2 →AB × →BC centre of gr. ABC = [2.;-] →p = →AB = ([2.;1.5;0.] IC ↔p = 7.34847 ANAGEDM DEGAUTO FUNC 0/30 </pre> |
|--|--|--|

You can also try to calculate distance between line AB and point C, it is the same.

| | | |
|---|--|--|
| <pre> F1+ Point Vector F2+ F3+ F4+ F5+ F6+ F7+ F8+ Vector Line Plane STD Help (Approx) 3:enter(universal)2D 4:enter(direction)2D 5:show 6:intersection 7:variance 8:line+vector 9:point_line Hx → point ----- IC ↔p = 7.34847 ANAGEDM DEGAUTO FUNC 0/30 </pre> | <pre> F1+ Point Vector F2+ F3+ F4+ F5+ F6+ F7+ F8+ Vector Line Plane STD Help (Approx) *CD = (2.;4.;10.) area ABC = 8.21584 ----- point line Point: c Line: ab Enter=OK ESC=CANCEL ----- →p = →AB = ([2.;1.5;0.] IC ↔p = 7.34847 ANAGEDM DEGAUTO FUNC 0/30 </pre> | <pre> F1+ Point Vector F2+ F3+ F4+ F5+ F6+ F7+ F8+ Vector Line Plane STD Help (Approx) *CD = (2.;4.;10.) area ABC = 8.21584 ----- ΔABC area = 1/2 →AB × →BC centre of gr. ABC = [2.;-] →p = →AB = ([2.;1.5;0.] IC ↔p = 7.34847 IC ↔AB = 7.34847 ANAGEDM DEGAUTO FUNC 0/30 </pre> |
|---|--|--|

Calculate intersection of line p and line CD and store this point as X.

| | | |
|--|---|--|
| <pre> F1+ Point Vector F2+ F3+ F4+ F5+ F6+ F7+ F8+ Vector Line Plane STD Help (Approx) 1:enter (2 points) 2:enter (point,vec.) 3:enter(universal)2D 4:enter(direction)2D 5:show 6:intersection 7:variance 8:line+vector ----- IC ↔AB = 7.34847 ANAGEDM DEGAUTO FUNC 0/30 </pre> | <pre> F1+ Point Vector F2+ F3+ F4+ F5+ F6+ F7+ F8+ Vector Line Plane STD Help (Approx) *CD = (2.;4.;10.) intersection of lines Line: p Line: cd Enter=OK ESC=CANCEL ----- IC ↔p = 7.34847 IC ↔AB = 7.34847 ANAGEDM DEGAUTO FUNC 0/30 </pre> | <pre> F1+ Point Vector F2+ F3+ F4+ F5+ F6+ F7+ F8+ Vector Line Plane STD Help (Approx) *CD = (2.;4.;10.) area ABC = 8.21584 ----- ΔABC area = 1/2 →AB × →BC centre of gr. ABC = [2.;-] →p = →AB = ([2.;1.5;0.] IC ↔p = 7.34847 IC ↔AB = 7.34847 →p ∩ →CD = [3.;1.;0.] ANAGEDM DEGAUTO FUNC 0/30 </pre> |
|--|---|--|

Press F5.

```

F1- F2- F3- F4- F5- F6- F7- F8-
Point Vector Line Plane STD Help (Approx)
area = 1/2 * |AB x AC|
centre of ar. ABC = (2.:1)
cent
<>p = <>AB = (2.:1.5;0.1)
IC <>p1 = 7.34847
IC <>AB1 = 7.34847
<>p n <>CD = (3.:1.;0.)
X(3.:1.;0.)
ANAGEDM DEGAUTO FUNC 0/30
  
```

Enter plane r: $2x + 6y + 4z - 8 = 0$

```

F1- F2- F3- F4- F5- F6- F7- F8-
Point Vector Line Plane STD Help (Approx)
1:enter (3 points)
2:enter (point, 2 vec)
3:enter (universal)
4:show
5:intersec. line, pl.
6:intersec. 2 planes
7:point plane
8:variance of planes
X(3.:1.;0.)
ANAGEDM DEGAUTO FUNC 0/30
  
```

```

F1- F2- F3- F4- F5- F6- F7- F8-
Point Vector Line Plane STD Help (Approx)
enter plane - universal
ax+by+cz+d=0
name: r
a: 2
b: 6
c: 4
d: -8
Enter=OK ESC=CANCEL
X(3.:1.;0.)
ANAGEDM DEGAUTO FUNC 0/30
  
```

```

F1- F2- F3- F4- F5- F6- F7- F8-
Point Vector Line Plane STD Help (Approx)
centre of ar. ABC = (2.:1)
<>p = <>AB = (2.:1.5;0.1)
IC <>p1 = 7.34847
IC <>AB1 = 7.34847
<>p n <>CD = (3.:1.;0.)
X(3.:1.;0.)
#r = (2.x+6.y+4.z+-8.=0)
ANAGEDM DEGAUTO FUNC 0/30
  
```

Enter vectors a (3; 3; -1) and b (-1; 4; 1)

```

F1- F2- F3- F4- F5- F6- F7- F8-
Point Vector Line Plane STD Help (Approx)
1:enter (x,y,z)
2:enter (2 points)
3:show
4:size
5:vector+vector
6:vector-vector
7:vector*vector (sc)
8:vector/vector
X(3.:1.;0.)
#r = (2.x+6.y+4.z+-8.=0)
TYPE OR USE <>+<> (ENTER) OR (ESC)
ANAGEDM DEGAUTO FUNC 0/30
  
```

```

F1- F2- F3- F4- F5- F6- F7- F8-
Point Vector Line Plane STD Help (Approx)
enter vector
name: a
x: 3
y: 3
z: -1
Enter=OK ESC=CANCEL
X(3.:1.;0.)
#r = (2.x+6.y+4.z+-8.=0)
ANAGEDM DEGAUTO FUNC 0/30
  
```

```

F1- F2- F3- F4- F5- F6- F7- F8-
Point Vector Line Plane STD Help (Approx)
IC <>p1 = 7.34847
IC <>AB1 = 7.34847
<>p n <>CD = (3.:1.;0.)
X(3.:1.;0.)
#r = (2.x+6.y+4.z+-8.=0)
#a(3.;3.;-1.)
#b(-1.;4.;1.)
ANAGEDM DEGAUTO FUNC 0/30
  
```

And in the same way vector b...

```

F1- F2- F3- F4- F5- F6- F7- F8-
Point Vector Line Plane STD Help (Approx)
IC <>p1 = 7.34847
IC <>AB1 = 7.34847
<>p n <>CD = (3.:1.;0.)
X(3.:1.;0.)
#r = (2.x+6.y+4.z+-8.=0)
#a(3.;3.;-1.)
#b(-1.;4.;1.)
ANAGEDM DEGAUTO FUNC 0/30
  
```

Enter point E (5; 0; 0)

```

F1- F2- F3- F4- F5- F6- F7- F8-
Point Vector Line Plane STD Help (Approx)
1:enter [x,y,z]
2:show
3:distance 2 points
4:part of abscissa
5:point+vector
6:point-vector
7:centre of gravity
8:area of 3D a
#b(-1.;4.;1.)
TYPE OR USE <>+<> (ENTER) OR (ESC)
ANAGEDM DEGAUTO FUNC 0/30
  
```

```

F1- F2- F3- F4- F5- F6- F7- F8-
Point Vector Line Plane STD Help (Approx)
enter point
name: e
x: 5
y: 0
z: 0
Enter=OK ESC=CANCEL
#b(-1.;4.;1.)
ANAGEDM DEGAUTO FUNC 0/30
  
```

```

F1- F2- F3- F4- F5- F6- F7- F8-
Point Vector Line Plane STD Help (Approx)
<>p n <>CD = (3.:1.;0.)
X(3.:1.;0.)
#r = (2.x+6.y+4.z+-8.=0)
#a(3.;3.;-1.)
#b(-1.;4.;1.)
E(5.;0.;0.)
ANAGEDM DEGAUTO FUNC 0/30
  
```

Enter plane s: it includes point E and vectors a and b.

```

F1- F2- F3- F4- F5- F6- F7- F8-
Point Vector Line Plane STD Help (Approx)
1:enter (3 points)
2:enter (point, 2 vec)
3:enter (universal)
4:show
5:intersec. line, pl.
6:intersec. 2 planes
7:point plane
8:variance of planes
E(5.;0.;0.)
#s = (E+k*a+l*b) = (-7.)
ANAGEDM DEGAUTO FUNC 0/30
  
```

```

F1- F2- F3- F4- F5- F6- F7- F8-
Point Vector Line Plane STD Help (Approx)
enter plane - point and 2 vectors
name: s
point: e
vector: a
vector: b
Enter=OK ESC=CANCEL
E(5.;0.;0.)
#s = (E+k*a+l*b) = (-7.)
ANAGEDM DEGAUTO FUNC 0/30
  
```

```

F1- F2- F3- F4- F5- F6- F7- F8-
Point Vector Line Plane STD Help (Approx)
<>p n <>CD = (3.:1.;0.)
X(3.:1.;0.)
#r = (2.x+6.y+4.z+-8.=0)
#a(3.;3.;-1.)
#b(-1.;4.;1.)
E(5.;0.;0.)
#s = (E+k*a+l*b) = (-7.)
ANAGEDM DEGAUTO FUNC 0/30
  
```

Calculate intersection of planes r and s and store it as line q.

```

F1- F2- F3- F4- F5- F6- F7- F8-
Point Vector Line Plane STD Help (Approx)
1:enter (3 points)
2:enter (point, 2 vec)
3:enter (universal)
4:show
5:intersec. line, pl.
6:intersec. 2 planes
7:point plane
8:variance of planes
#s = (E+k*a+l*b) = (-7.)
ANAGEDM DEGAUTO FUNC 0/30
  
```

```

F1- F2- F3- F4- F5- F6- F7- F8-
Point Vector Line Plane STD Help (Approx)
intersec. 2 planes
Plane: r
Plane: s
Enter=OK ESC=CANCEL
E(5.;0.;0.)
#s = (E+k*a+l*b) = (-7.)
ANAGEDM DEGAUTO FUNC 0/30
  
```

```

F1- F2- F3- F4- F5- F6- F7- F8-
Point Vector Line Plane STD Help (Approx)
<>p n <>CD = (3.:1.;0.)
X(3.:1.;0.)
#r = (2.x+6.y+4.z+-8.=0)
#a(3.;3.;-1.)
#b(-1.;4.;1.)
E(5.;0.;0.)
#s = (E+k*a+l*b) = (-7.)
#r n #s = <>(4.91304; -1.30)
ANAGEDM DEGAUTO FUNC 0/30
  
```

Press F5.

```

F1- F2- F3- F4- F5- F6- F7- F8-
Point Vector Line Plane STD Help (Approx)
#r = (2,3,1,1,0,1)
#s = (2,3,1,1,0,1)
name of line: q
Enter=OK ESC=CANCEL
E(5,0,0,0)
#s = (E+k*a+1*b) = (-7,.)
#r n #s = ↔(14.91304;-30)
↔a(14.91304;-304348;0,1)
ANAGEDM DEGAUTO FUNC 0/30
  
```

Calculate intersection of lines p and q.

```

F1- F2- F3- F4- F5- F6- F7- F8-
Point Vector Line Plane STD Help (Approx)
intersection of lines
line: p
line: q
Enter=OK ESC=CANCEL
#r n #s = ↔(14.91304;-30)
↔a(14.91304;-304348;0,1)
↔p n ↔q = 0.
ANAGEDM DEGAUTO FUNC 0/30
  
```

You can see that the intersection does not exist.

Calculate point Z which is point A moved in direction of vector c.

```

F1- F2- F3- F4- F5- F6- F7- F8-
Point Vector Line Plane STD Help (Approx)
1:enter (x,y,(z))
2:show
3:distance 2 points
4:part of abscissa
5:point+vector
6:point-vector
7:centre of gravity
8:area of 3D
↔p n ↔q = 0.
ANAGEDM DEGAUTO FUNC 0/30

F1- F2- F3- F4- F5- F6- F7- F8-
Point Vector Line Plane STD Help (Approx)
point+vector
point: a
vector: c
Enter=OK ESC=CANCEL
#s = (E+k*a+1*b) = (-7,.)
#r n #s = ↔(14.91304;-30)
↔a(14.91304;-304348;0,1)
↔p n ↔q = 0.
A + c = [4,;5,5;10,]
Z[4,;5,5;10,]
ANAGEDM DEGAUTO FUNC 0/30
  
```

Press F5.

```

F1- F2- F3- F4- F5- F6- F7- F8-
Point Vector Line Plane STD Help (Approx)
#s = (E+k*a+1*b) = (-7,.)
#r n #s = ↔(14.91304;-30)
↔a(14.91304;-304348;0,1)
↔p n ↔q = 0.
A + c = [4,;5,5;10,]
Z[4,;5,5;10,]
ANAGEDM DEGAUTO FUNC 0/30

F1- F2- F3- F4- F5- F6- F7- F8-
Point Vector Line Plane STD Help (Approx)
enter line - point and vector
name: r
point: z
vector: b
Enter=OK ESC=CANCEL
A + c = [4,;5,5;10,]
Z[4,;5,5;10,]
ANAGEDM DEGAUTO FUNC 0/30
  
```

Enter line r, which has direction of vector b and and goes through point Z.

```

F1- F2- F3- F4- F5- F6- F7- F8-
Point Vector Line Plane STD Help (Approx)
#s = (E+k*a+1*b) = (-7,.)
#r n #s = ↔(14.91304;-30)
↔a(14.91304;-304348;0,1)
↔p n ↔q = 0.
A + c = [4,;5,5;10,]
Z[4,;5,5;10,]
↔r = (Z+k*b) = (14,;5,5;)
ANAGEDM DEGAUTO FUNC 0/30

F1- F2- F3- F4- F5- F6- F7- F8-
Point Vector Line Plane STD Help (Approx)
point line
point: z
line: r
Enter=OK ESC=CANCEL
Z[4,;5,5;10,]
↔r = (Z+k*b) = (14,;5,5;)
ANAGEDM DEGAUTO FUNC 0/30
  
```

What is distance between line r and point E?

```

F1- F2- F3- F4- F5- F6- F7- F8-
Point Vector Line Plane STD Help (Approx)
#s = (E+k*a+1*b) = (-7,.)
#r n #s = ↔(14.91304;-30)
↔a(14.91304;-304348;0,1)
↔p n ↔q = 0.
A + c = [4,;5,5;10,]
Z[4,;5,5;10,]
↔r = (Z+k*b) = (14,;5,5;)
IE ↔r| = 8.4113
ANAGEDM DEGAUTO FUNC 0/30

F1- F2- F3- F4- F5- F6- F7- F8-
Point Vector Line Plane STD Help (Approx)
1:enter (point,vec.)
2:enter (universal)2D
3:enter (direction)2D
4:show
5:intersection
6:variance
7:line+vector
8:point line
↔r = (Z+k*b) = (14,;5,5;)
TYPE OR USE ↔+1+ (ENTER) OR (ESC)
ANAGEDM DEGAUTO FUNC 0/30
  
```

Enter 2D lines, s: $5x - 3y + 1 = 0$ and t: $2x + 2y - 6 = 0$

```

F1- F2- F3- F4- F5- F6- F7- FB
Point Vector Line Plane STD Help fApprox
1:enter (2 points)
2:enter (point,vec.)
3:enter (universal)2D
4:enter (direction)2D
5:show
6:intersection
7:variance
8:line+vector
IE ↔r| = 8.4113
ANAGEDM DEGAUTO FUNC 0/30
  
```

```

F1- F2- F3- F4- F5- F6- F7- FB
Point Vector Line Plane STD Help fApprox
enter line - universal 2D
ax+by+c=0
name: s
a: 5
b: -3
c: 1
Enter=OK ESC=CANCEL
↔p n ↔q = 0.
A + ↻c = [4.:5.5:10.]
Z[4.:5.5:10.]
↔r = (Z+k↻b) = ([4.:5.5:
IE ↔r| = 8.4113
↔s = (5.x+-3.y+1.=0)
  
```

And in the same way line t.

```

F1- F2- F3- F4- F5- F6- F7- FB
Point Vector Line Plane STD Help fApprox
↔p n ↔q = 0.
A + ↻c = [4.:5.5:10.]
Z[4.:5.5:10.]
↔r = (Z+k↻b) = ([4.:5.5:
IE ↔r| = 8.4113
↔s = (5.x+-3.y+1.=0)
↔t = (2.x+2.y+-6.=0)
ANAGEDM DEGAUTO FUNC 0/30
  
```

What is angle between lines s and t?

```

F1- F2- F3- F4- F5- F6- F7- FB
Point Vector Line Plane STD Help fApprox
1:enter (2 points)
2:enter (point,vec.)
3:enter (universal)2D
4:enter (direction)2D
5:show
6:intersection
7:variance
8:line+vector
IE ↔r| = 8.4113
↔s = (5.x+-3.y+1.=0)
↔t = (2.x+2.y+-6.=0)
↔s ∠ ↔t = 75.9638°
ANAGEDM DEGAUTO FUNC 0/30
  
```

```

F1- F2- F3- F4- F5- F6- F7- FB
Point Vector Line Plane STD Help fApprox
↔p n ↔q = 0.
A + ↻c = [4.:5.5:10.]
Z[4.:5.5:10.]
↔r = (Z+k↻b) = ([4.:5.5:
IE ↔r| = 8.4113
↔s = (5.x+-3.y+1.=0)
↔t = (2.x+2.y+-6.=0)
↔s ∠ ↔t = 75.9638°
  
```

Enter 2D vectors, e (3; 0), f (3; 3*√3) and g (8; 8)

```

F1- F2- F3- F4- F5- F6- F7- FB
Point Vector Line Plane STD Help fApprox
1:enter (x,y,(z))
2:enter (2 points)
3:show
4:size
5:vector+vector
6:vector-vector
7:vector*vector (sc)
8:vector*vector
↔s ∠ ↔t = 75.9638°
TYPE OR USE ↔t+ [ENTER] OR [ESC]
ANAGEDM DEGAUTO FUNC 0/30
  
```

```

F1- F2- F3- F4- F5- F6- F7- FB
Point Vector Line Plane STD Help fApprox
enter vector
name: e
x: 3
y: 0
z:
Enter=OK ESC=CANCEL
↔s ∠ ↔t = 75.9638°
↔e(3.;0.)
↔f(3.;5.19615)
↔g(8.;8.)
  
```

```

F1- F2- F3- F4- F5- F6- F7- FB
Point Vector Line Plane STD Help fApprox
↔p n ↔q = 0.
A + ↻c = [4.:5.5:10.]
Z[4.:5.5:10.]
↔r = (Z+k↻b) = ([4.:5.5:
IE ↔r| = 8.4113
↔s = (5.x+-3.y+1.=0)
↔t = (2.x+2.y+-6.=0)
↔s ∠ ↔t = 75.9638°
↔e(3.;0.)
  
```

And in the same way vectors f and g.

```

F1- F2- F3- F4- F5- F6- F7- FB
Point Vector Line Plane STD Help fApprox
enter vector
name: f
x: 3
y: 3*√(3)
z:
Enter=OK ESC=CANCEL
↔e(3.;0.)
↔f(3.;5.19615)
↔g(8.;8.)
ANAGEDM DEGAUTO FUNC 0/30
  
```

```

F1- F2- F3- F4- F5- F6- F7- FB
Point Vector Line Plane STD Help fApprox
↔p n ↔q = 0.
A + ↻c = [4.:5.5:10.]
Z[4.:5.5:10.]
↔r = (Z+k↻b) = ([4.:5.5:
IE ↔r| = 8.4113
↔s = (5.x+-3.y+1.=0)
↔t = (2.x+2.y+-6.=0)
↔s ∠ ↔t = 75.9638°
↔e(3.;0.)
↔f(3.;5.19615)
↔g(8.;8.)
  
```

But the vector f is 5.19615. We wanted $3\sqrt{3}$. What is wrong? Nothing, just turn off approx display mode by pressing F7.

```

F1- F2- F3- F4- F5- F6- F7- FB
Point Vector Line Plane STD Help fApprox
1:enter (x,y,(z))
2:enter (2 points)
3:show
4:size
5:vector+vector
6:vector-vector
7:vector*vector (sc)
8:vector*vector
↔q(8;8)
ANAGEDM DEGAUTO FUNC 0/30
  
```

```

F1- F2- F3- F4- F5- F6- F7- FB
Point Vector Line Plane STD Help fApprox
enter vector - show
name: f
Enter=OK ESC=CANCEL
↔q(8;8)
↔f = (3;3*√(3))
  
```

```

F1- F2- F3- F4- F5- F6- F7- FB
Point Vector Line Plane STD Help fApprox
↔p n ↔q = 0.
A + ↻c = [4.:5.5:10.]
Z[4.:5.5:10.]
↔r = (Z+k↻b) = ([4.:5.5:
IE ↔r| = 8.4113
↔s = (5.x+-3.y+1.=0)
↔t = (2.x+2.y+-6.=0)
↔s ∠ ↔t = 75.9638°
↔e(3.;0.)
↔f(3.;5.19615)
↔g(8.;8.)
↔q(8;8)
↔f = (3;3*√(3))
  
```

Ok. It is all right. It was stored correctly. It was only because of approx display mode.

Are vectors e and f linear dependent?

```

F1- F2- F3- F4- F5- F6- F7- F8-
Point Vector Line Plane STD Help Approx

7:vector*vector (sc)
8:vector*vector
9:vector*number
A:vector+|size|
B:variance
C:rotation
D:? lin. dependent.
E:u. depend. on 2 v.
f = (3;3*sqrt(3))
ANAGEDM DEGAUTO FUNC 0/30
  
```

```

F1- F2- F3- F4- F5- F6- F7- F8-
Point Vector Line Plane STD Help Approx

linearly dependent vectors?
vector: e
vector: f
<Enter=OK> <ESC=CANCEL>
+q(8:8)
+f = (3;3*sqrt(3))
ANAGEDM DEGAUTO FUNC 0/30
  
```

```

F1- F2- F3- F4- F5- F6- F7- F8-
Point Vector Line Plane STD Help Approx

+e(3.:0.)
+f(3.:5.19615)
+q(8.:8.)
+q(8:8)
+f = (3;3*sqrt(3))
+e ?1d +f = false
ANAGEDM DEGAUTO FUNC 0/30
  
```

No, they are not. So they can be understood as coordinates.

How you can express vector g by sum of vectors e and f?

```

F1- F2- F3- F4- F5- F6- F7- F8-
Point Vector Line Plane STD Help Approx

7:vector*vector (sc)
8:vector*vector
9:vector*number
A:vector+|size|
B:variance
C:rotation
D:? lin. dependent.
E:u. depend. on 2 v.
+e ?1d +f = false
TYPE OR USE +<ENTER> OR <ESC>
ANAGEDM DEGAUTO FUNC 0/30
  
```

```

F1- F2- F3- F4- F5- F6- F7- F8-
Point Vector Line Plane STD Help Approx

vector dependent on 2 vectors
target vector: g
1. vector: e
2. vector: f
<Enter=OK> <ESC=CANCEL>
+f = (3;3*sqrt(3))
+e ?1d +f = false
+g = k1*e + k2*f k1,k2=?
ANAGEDM DEGAUTO FUNC 0/30
  
```

```

F1- F2- F3- F4- F5- F6- F7- F8-
Point Vector Line Plane STD Help Approx

+e(3.:0.)
+f(3.:5.19615)
+q(8.:8.)
+q(8:8)
+f = (3;3*sqrt(3))
+e ?1d +f = false
+g = k1*e + k2*f k1,k2=?
ANAGEDM DEGAUTO FUNC 0/30
  
```

```

F1- F2- F3- F4- F5- F6- F7- F8-
Point Vector Line Plane STD Help Approx

+e(3.:0.)
+f(3.:5.19615)
+q(8.:8.)
+q(8:8)
+f = (3;3*sqrt(3))
+e ?1d +f = false
2=(8*sqrt(3)/9-8/3; -8*sqrt(3)/9)
ANAGEDM DEGAUTO FUNC 0/30
  
```

These numbers are coordinates of vector g in the base of vectors e and f. We can turn on approx display mode by pressing F7.

```

F1- F2- F3- F4- F5- F6- F7- F8-
Point Vector Line Plane STD Help Approx

+f(3.:5.19615)
+q(8.:8.)
+q(8:8)
+f = (3;3*sqrt(3))
+e ?1d +f = false
2=(8*sqrt(3)/9-8/3; -8*sqrt(3)/9)
k1,k2=(-1.12707; -1.5396)
ANAGEDM DEGAUTO FUNC 0/30
  
```

Rotate vector e so vectors e and f will be linearly dependent.

Ok. But we do not know the angle at this time.

```

F1- F2- F3- F4- F5- F6- F7- F8-
Point Vector Line Plane STD Help Approx

6:vector+vector
7:vector*vector (sc)
8:vector*vector
9:vector*number
A:vector+|size|
B:variance
C:rotation
D:? lin. dependent.
k1,k2=(-1.12707; -1.5396)
ANAGEDM DEGAUTO FUNC 0/30
  
```

```

F1- F2- F3- F4- F5- F6- F7- F8-
Point Vector Line Plane STD Help Approx

vector+vector
vector: e
vector: f
<Enter=OK> <ESC=CANCEL>
2=(8*sqrt(3)/9-8/3; -8*sqrt(3)/9)
k1,k2=(-1.12707; -1.5396)
ANAGEDM DEGAUTO FUNC 0/30
  
```

```

F1- F2- F3- F4- F5- F6- F7- F8-
Point Vector Line Plane STD Help Approx

+q(8.:8.)
+f = (3;3*sqrt(3))
+e ?1d +f = false
2=(8*sqrt(3)/9-8/3; -8*sqrt(3)/9)
k1,k2=(-1.12707; -1.5396)
+e z +f = 60.°
ANAGEDM DEGAUTO FUNC 0/30
  
```

Ok, it is 60 degrees.

```

F1- F2- F3- F4- F5- F6- F7- F8-
Point Vector Line Plane STD Help Approx

5:vector+vector
6:vector+vector
7:vector*vector (sc)
8:vector*vector
9:vector*number
A:vector+|size|
B:variance
C:rotation
+e z +f = 60.°
ANAGEDM DEGAUTO FUNC 0/30
  
```

```

F1- F2- F3- F4- F5- F6- F7- F8-
Point Vector Line Plane STD Help Approx

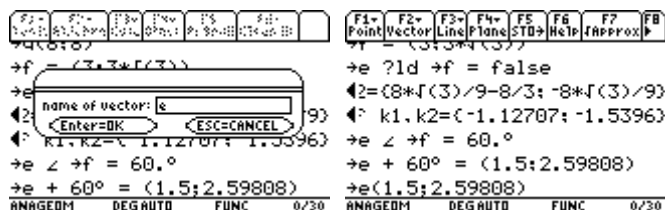
rotation
vector: e
angle: 60
<Enter=OK> <ESC=CANCEL>
k1,k2=(-1.12707; -1.5396)
+e z +f = 60.°
ANAGEDM DEGAUTO FUNC 0/30
  
```

```

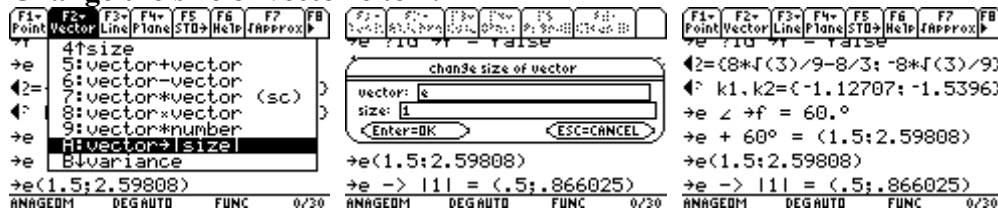
F1- F2- F3- F4- F5- F6- F7- F8-
Point Vector Line Plane STD Help Approx

+f = (3;3*sqrt(3))
+e ?1d +f = false
2=(8*sqrt(3)/9-8/3; -8*sqrt(3)/9)
k1,k2=(-1.12707; -1.5396)
+e z +f = 60.°
+e + 60° = (1.5;2.59808)
ANAGEDM DEGAUTO FUNC 0/30
  
```

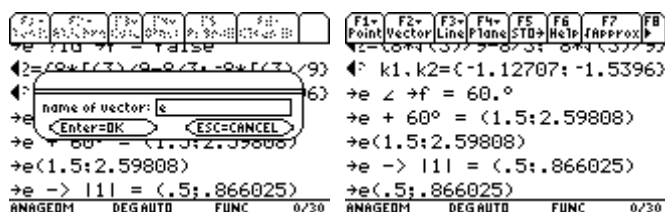
Press F5.



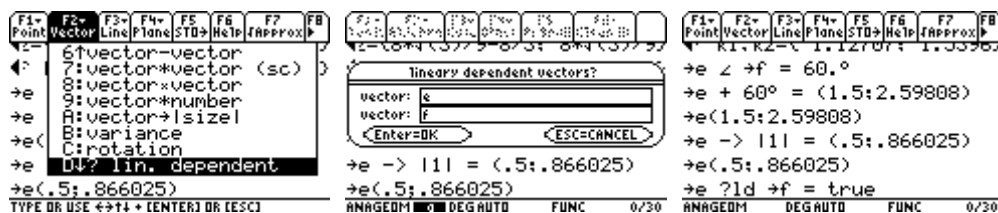
Change the size of vector e to 1.



Press F5.



Are vectors e and f linear dependent?



Yes, they are. So they cannot be understood as coordinates any more.

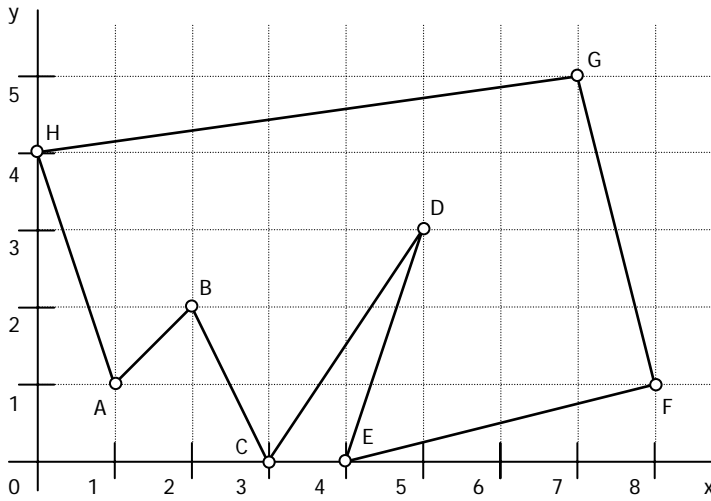
How you can express vector g by sum of vectors e and f ?

It is tricky question because e and f are not coordinates. Let's see:



Exactly as I have said. Press ENTER and ESC.

Start new problem and calculate the area and the centre of gravity of this polygon.



```

F1- F2- F3- F4-
4- Problem Lon3ug3e Exit
1:show 1:1270r4 1.3396
2:new 50.0
e + 60° = (1.5;2.59808)
e(1.5;2.59808)
e -> |l| = (.5;.866025)
e(.5;.866025)
e ?ld +f = true
ANAGEDM DEGAUTO FUNC 0/30 ANAGEDM DEGAUTO FUNC 0/30
  
```

Enter all points A through H.

```

F2- F3- F4- F5- F6- F7- F8-
1:show 1:1270r4 1.3396
2:new 50.0
e + 60° = (1.5;2.59808)
e(1.5;2.59808)
e -> |l| = (.5;.866025)
e(.5;.866025)
e ?ld +f = true
ANAGEDM DEGAUTO FUNC 0/30
  
```

```

F1- F2- F3- F4- F5- F6- F7- F8-
Point Vector Line Plane STD Help fApprox
A[1.;1.]
B[2.;2.]
C[3.;0.]
D[5.;3.]
E[4.;0.]
F[8.;1.]
ANAGEDM DEGAUTO FUNC 0/30 ANAGEDM DEGAUTO FUNC 0/30
  
```

```

F1- F2- F3- F4- F5- F6- F7- F8-
Point Vector Line Plane STD Help fApprox
B[2.;2.]
C[3.;0.]
D[5.;3.]
E[4.;0.]
F[8.;1.]
G[7.;5.]
H[0.;4.]
ANAGEDM DEGAUTO FUNC 0/30
  
```

```

F1- F2- F3- F4- F5- F6- F7- F8-
Point Vector Line Plane STD Help fApprox
2:show
3:distance 2 points
4:part of abscissa
5:point+vector
6:point-vector
7:centre of gravity
8:area of 3D
9:area of 2D polygon
H[0.;4.]
TYPE OR USE ←+1+ [ENTER] OR [ESC]
ANAGEDM DEGAUTO FUNC 0/30
  
```

```

F1- F2- F3- F4- F5- F6- F7- F8-
Point Vector Line Plane STD Help fApprox
C[3.;0.]
D[5.;3.]
E[4.;0.]
F[8.;1.]
G[7.;5.]
H[0.;4.]
area ABCDEFGH = 26.
ANAGEDM DEGAUTO FUNC 1/30
  
```

```

F1- F2- F3- F4- F5- F6- F7- F8-
Point Vector Line Plane STD Help fApprox
1:enter [x,y,(z)]
2:show
3:distance 2 points
4:part of abscissa
5:point+vector
6:point-vector
7:centre of gravity
8:area of 3D
area ABCDEFGH = 26.
ANAGEDM DEGAUTO FUNC 1/30
  
```

```

F1- F2- F3- F4- F5- F6- F7- F8-
Point Vector Line Plane STD Help fApprox
D[5.;3.]
E[4.;0.]
F[8.;1.]
G[7.;5.]
H[0.;4.]
area ABCDEFGH = 26.
centre of gr. ABCDEFGH = [3.75;2.]
ANAGEDM DEGAUTO FUNC 1/30
  
```

```

F1- F2- F3- F4- F5- F6- F7- F8-
Point Vector Line Plane STD Help fApprox
E[4.;0.]
F[8.;1.]
G[7.;5.]
H[0.;4.]
area ABCDEFGH = 26.
gr. ABCDEFGH = [3.75;2.]
ANAGEDM DEGAUTO FUNC 1/30
  
```

Enjoy Anageom! And remember – if you like it, donate, please. More info in readme.txt.