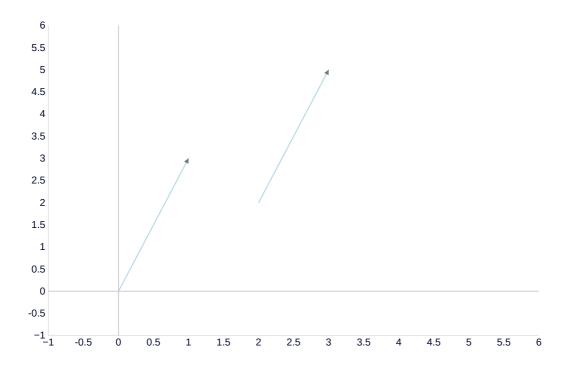
3



(3, 5)

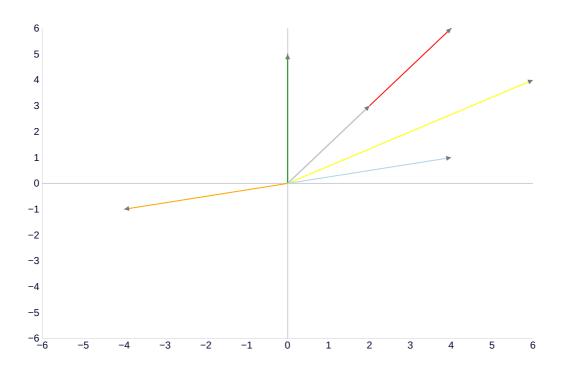
11

 $ec{PQ}=\langle -1,24
angle$

21

В

23



$$egin{aligned} 2ec{v} &= \langle 4,6
angle = ec{red} \ -ec{w} &= \langle -4,-1
angle = or ec{ange} \ ec{v} + ec{w} &= \langle 6,4
angle = yellow \ 2ec{v} - ec{w} &= \langle 0,5
angle = grec{e}en \end{aligned}$$

35

Yes, and yes. $\langle 2, 3 \rangle$ and $\langle 6, 9 \rangle$ point in the same direction and are parallel.

67

$$\begin{split} \vec{F}_1 + \vec{F}_2 &= -\vec{g} \\ \langle -\|\vec{F}_1\|\cos(65°), \|\vec{F}_1\|\sin(65°)\rangle + \langle \|\vec{F}_2\|\cos(25°), \|\vec{F}_2\|\sin(25°)\rangle = \langle 0, -500\rangle \\ \|\vec{F}_1\|\cos(65°) &= \|\vec{F}_2\|\cos(25°) \\ \|\vec{F}_1\|\sin(65°) + \|\vec{F}_2\|\sin(25°) &= 500 \\ \|\vec{F}_2\| &= \|\vec{F}_1\|\frac{\cos(65°)}{\cos(25°)} \\ \|\vec{F}_1\|\sin(65°) + \|\vec{F}_1\|\frac{\cos(65°)}{\cos(25°)}\sin(25°) &= 500 \\ \|\vec{F}_1\|(\sin(65°) + \frac{\cos(65°)}{\cos(25°)}\sin(25°)) &= 500 \\ \|\vec{F}_1\|(1.103) &= 500 \\ \|\vec{F}_1\| &= 453.3 \\ \|\vec{F}_2\| &= 211.4 \end{split}$$

12.2

13

A and C, $\langle 4, 8, 12 \rangle \| \langle 2, 4, 6 \rangle \| \langle -7, -14, -21 \rangle$

$$ec{AB}=\langle -3,-2,-1
angle \ ec{PQ}=\langle -5,-3,-6
angle \ ext{No, } ec{AB}
eq ec{PQ}$$

$$ec{v}(t) = \langle 1, 2, -8
angle + t \langle 2, 1, 3
angle$$

$$ec{v}(t) = \langle 4,0,8
angle + t \langle 7,0,4
angle$$

$$ec{v}(t)=t\langle 0,0,1
angle$$

$$ec{r_1}(t_1) = \langle 3, -1, 4 \rangle + t_1 \langle 8, 12, -6
angle \ ec{r_2}(t_2) = \langle 11, 11, -2
angle + t_2 \langle 4, 6, -3
angle$$

Let
$$t_2 = 2t_1 - 2$$

$$ec{r_2}(t_2) = \langle 11, 11, -2 \rangle + (2t_1 - 2)\langle 4, 6, -3
angle \ ec{r_2}(t_2) = \langle 11, 11, -2
angle + 2t_1\langle 4, 6, -3
angle - \langle 8, 12, -6
angle \ ec{r_2}(t_2) = \langle 3, -1, 4
angle + t_1\langle 8, 12, -6
angle$$

$$\therefore \vec{r_1}(t) = \vec{r_2}(2t-2)$$

And do represent the same line.

$$egin{aligned} ec{r_1}(t) &= \langle -1,2,2
angle + t\langle 4,-2,1
angle \ ec{r_2}(s) &= \langle 0,1,1
angle + s\langle 2,0,1
angle \ \langle -1,2,2
angle + t\langle 4,-2,1
angle &= \langle 0,1,1
angle + s\langle 2,0,1
angle \end{aligned}$$

$$-1 + 4t = 2s$$

$$2 - 2t = 1$$

$$2 + t = 1 + s$$

$$t = 0.5$$

$$1 = 2s$$

$$s = 0.5$$

Since the equations for the lines never equal, they never intersect.

$$ec{r}(t) = \langle 2,1,4
angle + t\langle 3,2,-1
angle \ 0 = 4-t \ t = 4 \min$$

The meteor will hit the ground after 4 minutes.