Forms of Linear Equations

Slope-Intercept Form

$$y = mx + c$$

Point-Gradient Form

$$y - y_1 = m(x - x_1)$$

Standard Form

$$ax + by + c = 0$$

Janis, Ilvija, and Ulvis are all working weekend jobs where they get paid a fixed amount for showing up on Saturday, then a set hourly wage over the two days.

a) Ilvija's hourly wage is 6.1 euros per hour. After 14 hours, she has earned 170.4 in total.

i. Write a model for her earnings in point-gradient form.

ii. Change the model to slope-intercept form.

b) After 9 hours, Janis has earned 130 euros and after 15 hours, he has earned 137.

i. Find his hourly wage.

ii. Write a model for his earnings in point-gradient form.

iii. Change the model to slope-intercept form.

c) Ulvis' earnings are modelled by the standard form equation: $21x - 2y + 28 = 0$

i. Re-write his earning's model in slope-intercept form.

ii. State his hourly wage.

d) Write the three slope intercept forms for each person:

i) Ilvija : ii) Janis : iii) Ulvis :

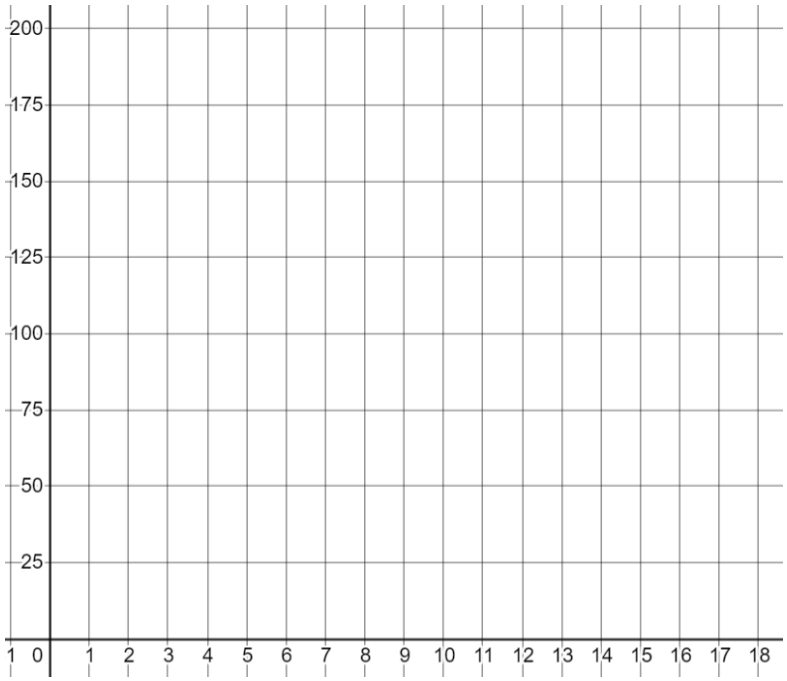
Considering the models, who makes the most for "showing up" on Saturday? Explain.

Considering the models, who makes the most per hour? Explain.

e) On Saturday, they work only 5 hours. Use the models to find how much each has earned so far.

f) On Sunday, they are needed for a longer shift. They all work an additional 12 hours. Use the models to find how much each has earned for the entire weekend of work.

g) Graph the earnings models for all three people below, using three different colors.



h) Using your equations, find at exactly how many hours Ilvija surpasses Janis.

i) Using your equations, find at exactly how many hours Ulvis surpasses Ilvija.

Bike & Bloom sells flower bouquets. The equation modelling the total cost, C, of making a number of bouquets, x, is $C = 6000 + 72x$, where C is given in Danish Krona, DKK.

a Find the gradient of the line representing the equation.

b Interpret the meaning of the gradient.

c Determine the y-intercept.

d Could the total cost per month be zero if no bouquets are made?

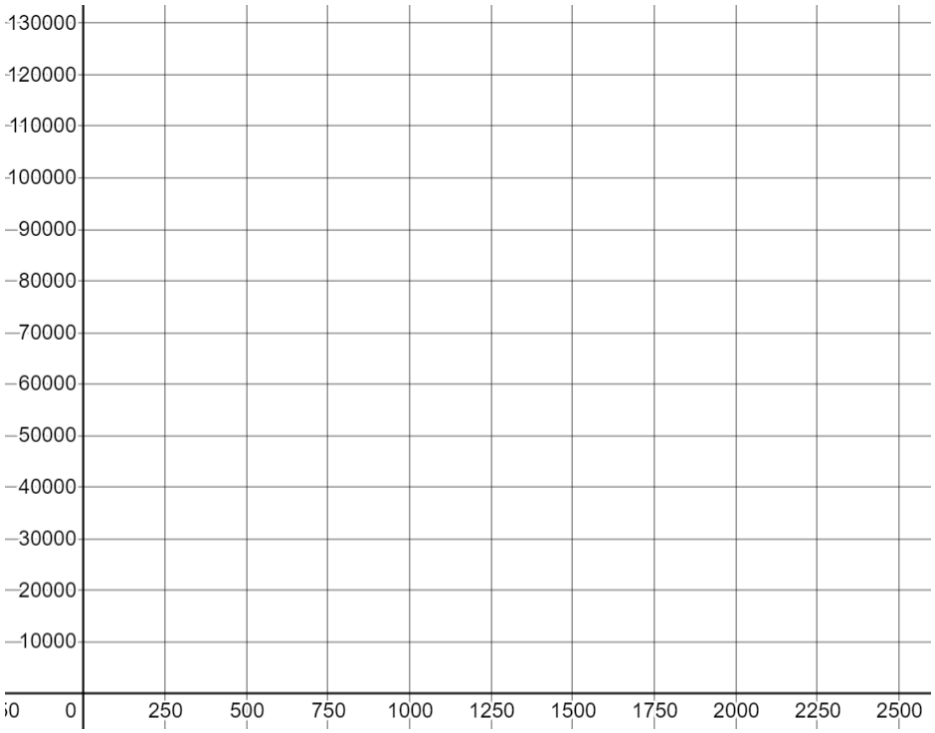
The total cost in a certain month is 112 720 DKK.

e Draw on the same axes the graph of:

i the line representing a cost of 112 720 DKK

ii the equation modelling the total cost, C.

f Find the number of bouquets made if the cost is 112 720 DKK.



Brooklake town had only 50 social housing units when the new social programme started. Since then it has been adding new social housing units at a steady rate. Now, 17 years later, the town has a total of 322 social housing units.

a Find the rate of increase in social housing units per year.

b Write an equation for the total number of housing units, h, that the town had in relation to the number of years, x, that have passed since the social programme started.

c Draw the graph of the line representing this equation.

d Determine the gradient of the line. Interpret its meaning.

e Determine the y-intercept of the line. Interpret its meaning.

f Determine how many social housing units the town had 13 years after starting the programme.

g Predict the number of social housing units that the town will have 22 years after starting the programme. State your assumptions.

h Determine the year in which the town added its 200th social housing unit after the programme began.

