

A: Write the equation of the straight lines that pass through the following points in the form:

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

b $y = mx + c$

c $ax + by + c = 0$ where $a, b, c \in \mathbb{Z}$

1 (4, 1) and (0, -3)

2 (9,12) and (-6,8)

3 (5,5) and (0.7, 3.9)

B: Find the gradient and the y-intercept of the following lines.

1 $5x - 7y + 9 = 0$

2 $y = 12 - \frac{4x}{3}$

3 $9(2 - y) = \frac{4}{5}x$

4 $8y - 7x = 12$

5 $\frac{x-5}{6} = 8 - \frac{4-y}{3}$

C: At a café, a small cup of coffee costs £ x and a large cup costs £ y . Heidi buys 4 small cups and 3 large cups at a cost of £37.

1 Write this as an equation in the form $ax + by + c = 0$.

2 Draw a straight line graph of this equation.

Mark buys two small cups and 5 large cups at a cost of £43.

3 Write a second equation of Mark's purchase and draw the graph on the same axes.

4 Write down the cost of a small cup of coffee and a large cup of coffee.

D: Find the midpoint of the following line segments and state the exact length of each line segment.

1 (4,8) to (9,-7)

2 (8,8) to (26,1.9)

3 $(2\frac{3}{4}, 1\frac{2}{5})$ to $(-\frac{7}{8}, \frac{4}{5})$

E: A group of walkers are mapping their hike from point A at 216945 to point B at 219732. After 850 metres, one of the walkers twists his ankle badly. His companions will have to carry him to one of the aid stations located at point A and point B. Which is closer?

F: A line segment is drawn between points A ($3a, a$) and B ($b, b + 5$). The line segment has a gradient of $-\frac{10}{3}$ and a midpoint at $(10\frac{1}{2}, 9)$. Find the exact distance between points A and B.

G: A line segment AB has a midpoint (1,2), a gradient of $\frac{3}{4}$ and length 5. Find the co-ordinates of end points A and B.