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PURE MATH

ALGEBRA AND FUNCTION

Level & Board	EDEXCEL (A-LEVEL)
TOPIC:	LINEAR MODAL
PAPER TYPE:	SOLUTION - 4
TOTAL QUESTIONS	8
TOTAL MARKS	37

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Q1.

To find the slope (m) of a savings account's balance in thousands of dollars over time in years, we can use the formula:

$$m = (\text{change in balance}) / (\text{change in time})$$

In this case, the balance changed from \$5,000 to \$18,000 over a period of 3 years, which gives us:

$$m = (18,000 - 5,000) / (3 - 1) = 13,000 / 2 = 6,500$$

Next, we can use one of the points (1, 5) to find the y-intercept (b) of the equation that models the balance over time. The equation is:

$$B = mt + b$$

Substituting the values we know, we get:

$$5,000 = 6,500(1) + b$$

Solving for b, we get:

$$b = 5,000 - 6,500 = -1,500$$

Therefore, the equation that models the balance (B) in thousands of dollars over time (t in years) for this savings account is:

$$B = 6,500t - 1,500$$

This equation can be used to predict the balance for any given time in the future. For example, if you want to know the balance after 2 years ($t = 2$), you can substitute $t = 2$ into the equation:

$$B = 6,500(2) - 1,500$$

Therefore, the balance after 2 years would be \$11,500.

Q2.

Find the slope (m):

$m = \text{change in } y / \text{change in } x$

$$x = (32,000 - 7,000) / (6 - 2) = 25,000 / 4 = 6,250$$

Now, use one of the points (let's use (2,7)) to find the y-intercept (b):

$$y = mx + b$$

$$7,000 = 6,250(2) + b$$

$$b = 7,000 - 12,500 = -5,500$$

So, the equation that models the balance (B) in thousands of dollars over time (t in years) for this savings account is:

$$B = 6,250t - 5,500$$

This equation can be used to predict the balance for any given time in the future. For example, if you want to know the balance after 3 years (t = 3):

$$B = 6,250(3) - 5,500 = 13,750$$

Therefore, the balance after 3 years would be \$13,750.

Q3.

To find the slope (m) of a savings account balance over time, we use the formula:

$m = \text{change in balance} / \text{change in time}$

In this case, the change in balance is \$21,000 - \$3,000 = \$18,000 over a period of 5 - 1 = 4 years, so:

$$m = \$18,000 / 4 = \$4,500$$

To find the y-intercept (b) of the equation that models the balance (B) over time (t), we use one of the points on the line. Let's use the point (1,3):

$$B = mt + b$$

$$3,000 = \$4,500(1) + b$$

Simplifying the equation, we get:

$$b = \$3,000 - \$4,500 = -\$1,500$$

So the equation that models the balance (B) over time (t) is:

$$B = \$4,500t - \$1,500$$

This equation can be used to predict the balance for any given time in the future. For example, if we want to know the balance after 2 years ($t = 2$), we simply substitute 2 for t:

$$B = \$4,500(2) - \$1,500 = \$7,500$$

Therefore, the balance after 2 years would be \$7,500.

Q4.

Find the slope (m):

$$m = \text{change in } y / \text{change in } x$$

$$x = 24,000 - 6,000 / 6 - 2 = 18,000 / 4 = 4,500$$

Now, using one of the points (let's use (2, 6)),

we can find the y-intercept (b):

$$y = mx + b$$

$$6,000 = 4,500(2) + b$$

$$b = -3,000$$

Therefore, the equation which models the balance (B) in thousands of dollars over time (t in years) for this savings account is:

$$B = 4,500t - 3,000$$

This equation can be used to predict the balance for any given time in the future. For example, if you want to know the balance after 3 years ($t=3$):

$$B = 4,500(3) - 3,000 = 9,000$$

Therefore, the balance after 3 years would be \$9,000.

Q5.

Find the slope (m):

$$m = \text{change in } y / \text{change in } x = (40,000 - 15,000) / (5 - 2) = 25,000/3$$

Now, use one of the points (let's use (2,15)) to find the y-intercept (b):

$$y = mx + b$$

$$15,000 = (25,000/3)(2) + b$$

$$b = 5,000/3$$

So, the equation that models the balance (B) in thousands of dollars over time (t in years) for this savings account is:

$$B = (25,000/3)t + 5,000/3$$

This equation can be used to predict the balance for any given time in the future. For example, if you want to know the balance after 3 years (t=3):

$$B = (25,000/3)(3) + 5,000/3 = 30,000$$

Therefore, the balance after 3 years would be \$30,000.

Q6.

Find the slope (m):

$$m = \text{change in } y / \text{change in } x = (25,000 - 10,000) / (3 - 1) = 15,000 / 2$$

Now, use one of the points (let's use (1,10)) to find the y-intercept (b):

$$y = mx + b$$

$$10,000 = (15,000 / 2)(1) + b$$

$$b = 10,000 - (15,000 / 2) = -5,000$$

So, the equation that models the balance (B) in thousands of dollars over time (t in years) for this savings account is:

$$B = (15,000 / 2)t - 5,000$$

This equation can be used to predict the balance for any given time in the future. For example, if you want to know the balance after 4 years (t = 4):

$$B = (15,000 / 2)(4) - 5,000 = 20,000$$

Therefore, the balance after 4 years would be \$20,000.

Q7.

Find the slope (m):

$$m = \text{change in } y / \text{change in } x = (30,000 - 8,000) / (6 - 1) = 22,000/5$$

Now, use one of the points (let's use (1, 8)) to find the y-intercept (b):

$$y = mx + b$$

$$8,000 = 22,000/5(1) + b$$

$$b = 4,600$$

So, the equation that models the balance (B) in thousands of dollars over time (t in years) for this savings account is:

$$B = 22,000/5t + 4,600$$

This equation can be used to predict the balance for any given time in the future. For example, if you want to know the balance after 3 years (t = 3):

$$B = 22,000/5(3) + 4,600 = 16,520$$

Therefore, the balance after 3 years would be \$16,520.

Q8.

To find the slope (m), use the formula:

$$m = \text{change in } y / \text{change in } x$$

In this case, the values are:

$$y_2 - y_1 = 42,000 - 12,000$$

$$x_2 - x_1 = 5 - 2$$

So, the slope is:

$$m = (42,000 - 12,000) / (5 - 2) = 30,000 / 3 = 10,000$$

Next, to find the y-intercept (b), use one of the points, let's use (2,12):

$$y = mx + b$$

$$12,000 = 10,000(2) + b$$

Simplifying the equation, we get:

$$b = 12,000 - 20,000 = -8,000$$

Therefore, the equation that models the balance (B) in thousands of dollars over time (t in years) for this savings account is:

$$B = 10,000t - 8,000$$

This equation can be used to predict the balance for any given time in the future. For example, if you want to know the balance after 3 years (t = 3):

$$B = 10,000(3) - 8,000 = 22,000$$

So, the balance after 3 years would be \$22,000.

I am Sorry !!!!!



DR. ASHAR RANA



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