Paper 1 - CALCULATOR INACTIVE

Full marks are not necessarily awarded for a correct answer with no working. Answers must be supported by working and/or explanations. Where an answer is incorrect, some marks may be given for a correct method, provided this is shown by written work. You are advised to show all working.

SECTION A

Answer all questions in the spaces provided.

1. Given the line $\frac{x}{3} - \frac{y}{5} = 1$;

(9 marks)

a. Determine the slope of this line.

b. Write the equation of this line in function form.

c. Evaluate $f(-12)$.

d. Solve for x if $95 = f(x)$.

2. Given the line $y - 6 = -\frac{2}{3}(x + 3)$, determine the x- and y-intercepts of this line.

(4 marks)

3. Solve the linear system defined by $2x - 4y = 8$ and $y - 2 = -\frac{3}{4}(x + 2)$. Verify your answer.

(7 marks)

Section B

Do NOT write solutions on this page. Answer all questions on the answer sheets provided. Again, remember that full marks are not necessarily awarded for a correct answer with no working. Answers must be supported by working and/or explanations. Where an answer is incorrect, some marks may be given for a correct method, provided this is shown by written work. You are advised to show all working.

1. The linear function, $f(x)$, can be rewritten in standard form as $4x - Ky + 26 = 0$. This function exists in the domain of $\{x \in R | -2 < x \leq 4\}$ and $f(1) = 10$.

(7 marks)

   a. Show that the value of K is 3.

   b. Given that $K = 3$, determine the range of $f(x)$.

2. Given the system $4x - 3y = 11$ and $3x - Dy = 7$.

(6 marks)

   a. What does it mean when we say that a system of linear equations has **no solution**.

   b. Find the value of D such that the system has no solution.

Paper 2 – CALCULATOR ACTIVE

Full marks are not necessarily awarded for a correct answer with no working. Answers must be supported by working and/or explanations. In particular, solutions found from a graphic display calculator should be supported by suitable working, e.g. if graphs are used to find a solution, you should sketch these as part of your answer. Where an answer is incorrect, some marks may be given for correct method, provided this is shown by written working. You are therefore advised to show all working.

SECTION A

Answer all questions in the spaces provided.

1. A linear function goes through the point A(5,-8) and this linear function is perpendicular to a second line, which has the equation of $3x - 5y - 20 = 0$.

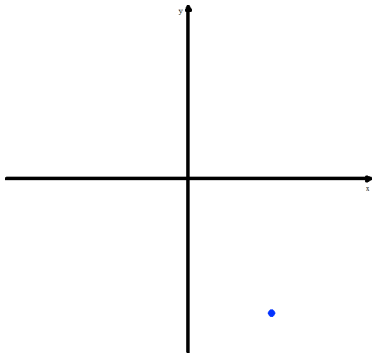
(9 marks)

a. Determine the slope of the line defined by $3x - 5y - 20 = 0$.

b. Hence, determine the equation of the second perpendicular line. Write the equation in point-slope form.

c. Write your final answer for the perpendicular line's equation using standard form.

d. Sketch a diagram, showing the two lines from this question. The point (5, -8) has already been added into the diagram.



2. A piecewise linear function is defined by the equation $p(x) = \begin{cases} 2x - 3 & x < 3 \\ -\frac{1}{3}x + B & x \geq 3 \end{cases}$

(7 marks)

a. Evaluate $p(-1)$.

b. Draw a diagram of a piecewise function that shows your understanding of functions being **continuous** at x = 3.

c. Draw a second diagram of a piecewise function that shows your understanding of functions being **discontinuous** at x = 3.

d. Determine the value of B so that the function $p(x)$ is **continuous** at x = 3. Show/explain supporting evidence for your answer.

Section B

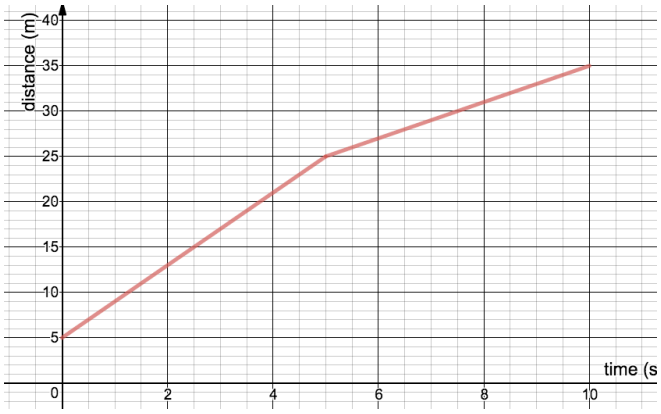
Do NOT write solutions on this page. Answer all questions on the answer sheets provided.

1. Your neighborhood friends have decided to have a running race down the street. Here is the information about the distance, d, in meters, (including a head start in some cases) in terms of time, t, in seconds.

(12 marks)

<table>
<tr>
<td>Mitchell

Runs 5 meters every 2 seconds and has a 6 meter head start</td>
<td>Kyra

Distance is modeled by the equation
$d(t) = \frac{9}{2}t + 3$</td>
</tr>
<tr>
<td>Gloria
 
</td>
<td>Hashem
<table>
<tr><td>20</td><td>22</td><td>24</td><td>26</td><td>28</td></tr>
<tr><td>77</td><td>84</td><td>91</td><td>98</td><td>105</td></tr>
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a. Determine an equation for Gloria's run.

b. Which runner has the fastest pace? Show necessary working to support your answer.

c. How far did Hashem go in the first ten seconds?

d. Who would win the race if the race was 50m long? Show necessary working to support your answer.