



Grade 8 Mathematics End-of-Term Exam Sample Paper

Grade	8	Chapters	1-5	Coursebook Pages	all
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Student Name		Class		Date	
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Multiple Choice: CALCULATOR NOT ALLOWED

1	A student mows one lawn each weekday after school and two lawns on Saturday. If he earns AED 50 per lawn, which of the following describes the amount of money he makes in w weeks?	
	A	$53w$
	B	$100w$
	C	$250w$
	D	$350w$

2	The number of tickets purchased and the total cost is described in the table below.													
	<table border="1"> <thead> <tr> <th style="background-color: #008000; color: white;">Number of Tickets Purchased</th> <th style="background-color: #008000; color: white;">Total Cost (AED)</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>10</td> </tr> <tr> <td>2</td> <td>20</td> </tr> <tr> <td>3</td> <td>30</td> </tr> <tr> <td>4</td> <td>40</td> </tr> <tr> <td>5</td> <td>50</td> </tr> </tbody> </table>		Number of Tickets Purchased	Total Cost (AED)	1	10	2	20	3	30	4	40	5	50
	Number of Tickets Purchased	Total Cost (AED)												
	1	10												
	2	20												
	3	30												
4	40													
5	50													
Describe the type of function based on the information in the table.														
A	continuous function													
B	discrete function													
C	step function													
D	nonlinear function													



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3	Write the sentence below as an equation.	
	<i>The difference of the square of c and twelve is the same as the product of five and d.</i>	
	A	$c^2 - 12 = 5d$
	B	$(c - 12)^2 = 5d$
	C	$c^2 - 12 = 5 \div d$
D	$(c - 12)^2 = 5 \div d$	

4	If $3x - y = -3$ were graphed, what would the zero be?	
	A	$(-3, 0)$
	B	$(-1, 0)$
	C	$(1, 0)$
	D	$(3, 0)$

5	Determine if the cost of coffee, in dollars, is proportional to the number of pounds. If it is a proportional relationship, write an equation. If it is not proportional, choose <i>non-proportional relationship</i> .											
	<table border="1" style="margin: auto;"> <tr> <td style="background-color: #006400; color: white;">Coffee, x (lb.)</td> <td>1</td> <td>2</td> <td>3</td> <td>4</td> </tr> <tr> <td style="background-color: #006400; color: white;">Cost, y (\$)</td> <td>3</td> <td>6</td> <td>9</td> <td>12</td> </tr> </table>		Coffee, x (lb.)	1	2	3	4	Cost, y (\$)	3	6	9	12
	Coffee, x (lb.)	1	2	3	4							
	Cost, y (\$)	3	6	9	12							
	A	$y = 3x$										
B	$y = 6x$											
C	$y = 9x$											
D	non-proportional relationship											



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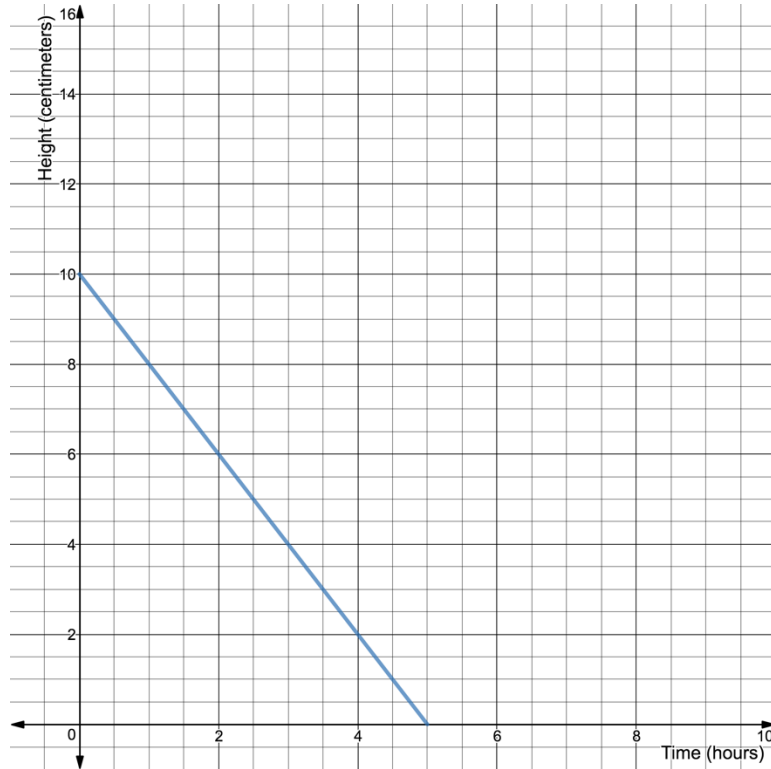
6	Find the inverse of the relation represented below.	
	$\{(1, 3), (4, -1), (7, -5), (10, -9)\}$	
	A	$\{(1, 3), (4, -1), (7, -5), (10, -9)\}$
	B	$\{(-1, -3), (-4, 1), (-7, 5), (-10, 9)\}$
	C	$\{(3, 1), (-1, 4), (-5, 7), (-9, 10)\}$
D	$\{(-3, -1), (1, -4), (5, -7), (9, -10)\}$	

7	You work 40 hours a week and earn d dirhams an hour. You get a raise of AED 11 an hour plus an AED 48 bonus in the first week. This can be represented by the algebraic expression below. Which of the following describes how much you will earn in the first week if you earned AED 89 an hour before the raise?	
	$40(d + 11) + 48$	
	A	AED 499
	B	AED 928
	C	AED 3619
D	AED 4048	



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The graph below represents the height of a burning candle over time. Interpret the meaning of the x -intercept.



8

- | | |
|----------|---|
| A | The candle starts at a height of 10 centimeters. |
| B | The candle has a height of 0 centimeters after burning for 5 hours. |
| C | It took 10 hours for the candle to fully burn. |
| D | It took 5 hours for the candle to reach 5 centimeters in height. |

In 1960, the annual production of video games was about 88,000. In 1990, that number had increased to 205,000. Which of the following describes the total percent of change from 1960 to 1990?

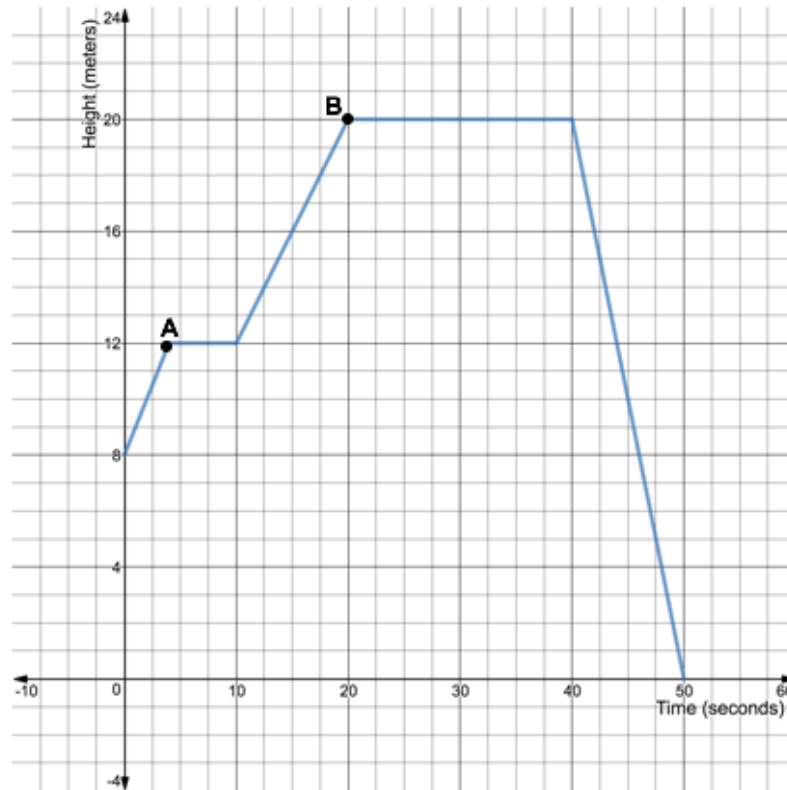
9

- | | |
|----------|-------------------------|
| A | less than 100% increase |
| B | over 100% increase |
| C | exactly 100% increase |
| D | exactly 200% increase |



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The graph below represents the height of an elevator over time. At $(0, 8)$, the elevator is on the second floor. When the height is equal to 0 meters, the elevator is on the ground floor. Interpret what is happening between point A (4 seconds) and point B (20 seconds).



10

A	The elevator goes from the second floor to the third floor at a constant speed.
B	The elevator is on the fifth floor for 20 seconds.
C	The elevator is on the third floor for a few seconds and then continues to the fifth floor at a constant speed.
D	The elevator goes from the fifth floor to the ground floor at a constant speed without stopping.



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11	The table below describes the playing time in minutes of high-definition videos and the file size of these videos in megabytes (MB).	
	<i>Playing Time, x (min.)</i>	<i>File Size, y (MB)</i>
	0.5	60
	1.5	180
	2	240
	4.5	540
	5	600
Explain the meaning of the slope.		
A	the increase in file size per minute	
B	the playing time of each video	
C	the increase in playing time per megabyte	
D	the file size of each video	

12	Mr. Saeed's class is making models using and piling wooden logs. The bottom row has 50 logs. The next row has 45 logs. This continues until the 10 th and top row has 5 logs. Using $f(n) = (n - 1)d + a_1$, write a function to represent the number of logs in the n th row.	
	A	$f(n) = 5n + 50$
	B	$f(n) = -5n + 55$
	C	$f(n) = 5n + 45$
	D	$f(n) = -5n + 45$

13	What is the solution to the equation shown below?	
	$-2(5c + 2) - 2c = 3(-c + 3) + 7$	
	A	no solution
	B	identity
	C	$c = -\frac{20}{9}$
D	$c = \frac{12}{11}$	



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14	For $f(x) = -3x + 5$, find $f(-4x + 6)$.	
	A	$-12x - 11$
	B	$-12x + 23$
	C	$12x + 11$
	D	$12x - 13$

15	Tarek helped his uncle last weekend. After working for 4 hours, his uncle paid him AED 60. Tarek's brother wants to help next weekend and was promised the same pay per hour. Write and solve a proportion to find how much Tarek's brother earns after 5 hours of work.	
	A	$\frac{4}{60} = \frac{5}{p}$; AED 48
	B	$\frac{5}{60} = \frac{4}{p}$; AED 48
	C	$\frac{4}{60} = \frac{5}{p}$; AED 75
	D	$\frac{5}{60} = \frac{4}{p}$; AED 75

16	Which of the following is the solution of the linear inequality below?	
	$3t - 2(t - 1) \geq 5t - 4(2 + t)$	
	A	<i>all real numbers</i>
	B	\emptyset
	C	$\{t \mid t \leq -\frac{5}{7}\}$
D	$\{t \mid t \leq \frac{3}{4}\}$	



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17	<p>Abeer and Lamya were working together. They solved the problem below.</p> <p><i>The sum of three consecutive integers is -255. Find the first integer.</i></p> $n + n + 1 + n + 2 = -255$ $n + n + n + 1 + 2 = -255$ $3n + 3 = -255$ $3n + 3 + 3 = -255 + 3$ $3n = -252$ $3n \div 3 = -252 \div 3$ $n = -84$	
	<p>Abeer stated that the highlighted step is correct and justified by the Addition Property of Equality, but Lamya stated that it is incorrect. Is either student correct in her thinking? Explain your reasoning.</p>	
	A	Neither is correct because the original equation is incorrect.
	B	Neither is correct because $n + n + n + 1 + 2$ should be rewritten as $6n$ not $3n + 3$.
	C	Abeer is correct because the Addition Property of Equality means adding the same number to both sides to keep the equation balanced.
	D	Lamya is correct because the Subtraction Property of Equality should have been used to subtract 3 from both sides to keep the equation balanced.

18	<p>Find the inverse of the function represented below.</p> $f(x) = \frac{3}{4}x - 8$	
	A	$f^{-1}(x) = 4x + 8$
	B	$f^{-1}(x) = 4x + 32$
	C	$f^{-1}(x) = \frac{4}{3}x + \frac{8}{3}$
	D	$f^{-1}(x) = \frac{4}{3}x + \frac{32}{3}$



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19	The number of packages as it relates to the total cost is represented in the table below.											
	<table border="1" style="margin: auto;"> <tr> <td style="background-color: #008000; color: white;">Number of Packages, x</td> <td>1</td> <td>2</td> <td>3</td> <td>4</td> </tr> <tr> <td style="background-color: #008000; color: white;">Total Cost, y (AED)</td> <td>11</td> <td>20</td> <td>29</td> <td>38</td> </tr> </table>		Number of Packages, x	1	2	3	4	Total Cost, y (AED)	11	20	29	38
	Number of Packages, x	1	2	3	4							
	Total Cost, y (AED)	11	20	29	38							
	Determine if this relationship is <i>proportional</i> or <i>non-proportional</i> . Write an equation.											
A	<i>proportional</i> ; $y = 9x$											
B	<i>non-proportional</i> ; $y = 9x + 2$											
C	<i>proportional</i> ; $y = 11x$											
D	<i>non-proportional</i> ; $y = 11x - 2$											

20	Which of the following is the solution of the absolute value inequality below?	
	$ 2x - 3 > 4$	
	A	$\{x x < -1 \text{ or } x > 7\}$
	B	$\{x x < 0.5 \text{ or } x > -3.5\}$
	C	$\{x x < -0.5 \text{ or } x > 3.5\}$
D	$\{x -0.5 < x < 3.5\}$	



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Constructed Response: CALCULATOR ALLOWED

The cost to paint a patio is a linear function of the patio's area. The cost to paint 100, 250, and 400 square feet are shown in the table below.

Area (ft^2)	Cost (\$)
100	150
250	337.50
400	525

- a) Find the slope and write an equation in point-slope form that represents this function.

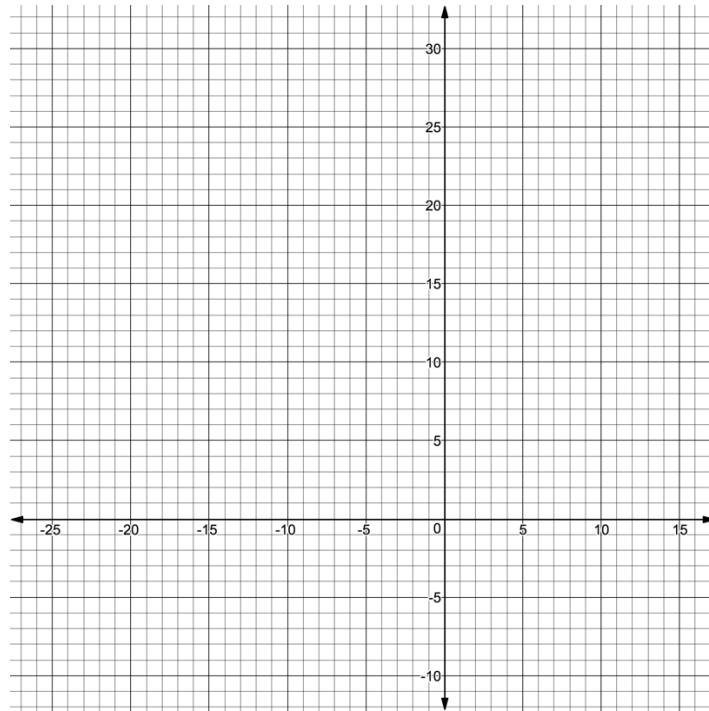
- b) Write the equation in slope-intercept form.

This question is continued on the next page.



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c) Graph the equation from the previous page.



d) Write the equation in standard form.

e) Find the cost to paint an area of 60 square feet.

(/6 marks)



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22

Use the absolute value equation $3|x - 2| - 10 = 11$ to do the following:

- a) Solve the equation and determine the solution set.

solution set: _____

- b) In the space below, graph the solution set using correct graphing techniques.



(/6 marks)

23

There are 1000 students at the graduation ceremony. Two hundred students accept their diplomas every hour. The number of remaining students s to accept their diplomas after h hours have passed is described by the equation below.

$$1000 - 200h = s$$

- a) Find the zero of this function.

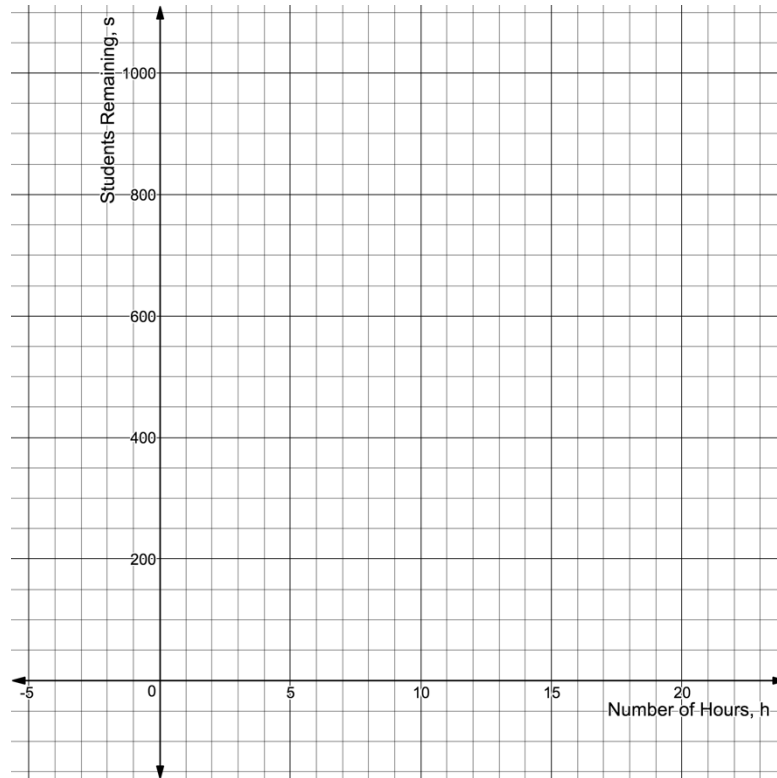
- b) What is the domain of the function? _____

This question is continued on the next page.



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- c) Graph this situation with appropriate domain restrictions.



- d) Explain what the zero represents in this context.

- e) What is the range of the function? _____

(/6 marks)

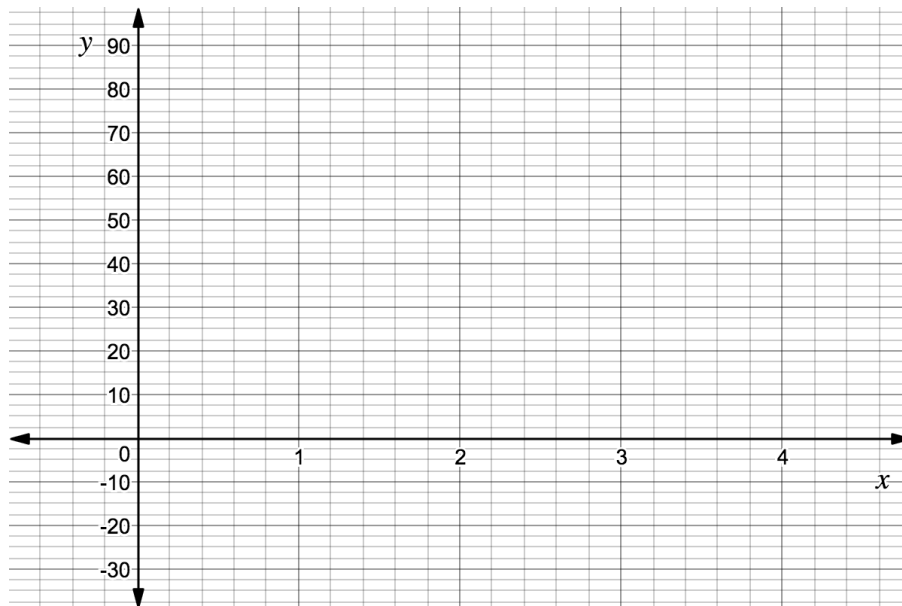


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The distance a car travels varies directly with time. The car travels 320 kilometers in 4 hours.

- a) Write an equation that relates distance to time.

- b) Graph the equation from part a. Then graph the equations $y = 40x$ and $y = 20x$ on the same coordinate plane.



- c) Explain how a constant of variation, the slope of a line, and the rate of change of a graph are related.

- d) Explain how you would determine which direct variation equation has the steepest graph without graphing it.

(/6 marks)



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25

$$w - 4 \leq 4w + 8 \quad \text{and} \quad 3w < 14 - 4w$$

Use the compound inequality shown above to complete the following:

- a) Solve the compound inequality.

- b) In the space below, graph the solution set.



- c) Determine if the graph is a *union* or an *intersection*.

(/6 marks)

Multiple Choice	/20
Constructed Response	/30
Total Marks	/50
Percentage	/100%



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Answer Key

Multiple Choice

Q1	D
Q2	B
Q3	A
Q4	B
Q5	A
Q6	C
Q7	D
Q8	B
Q9	B
Q10	C
Q11	A
Q12	B
Q13	C
Q14	D
Q15	C
Q16	A
Q17	D
Q18	D
Q19	B
Q20	C



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Constructed Response

- a) One mark should be awarded for a slope of $\frac{5}{4}$ or 1.25.

If the student states an equivalent fraction, still award the mark.

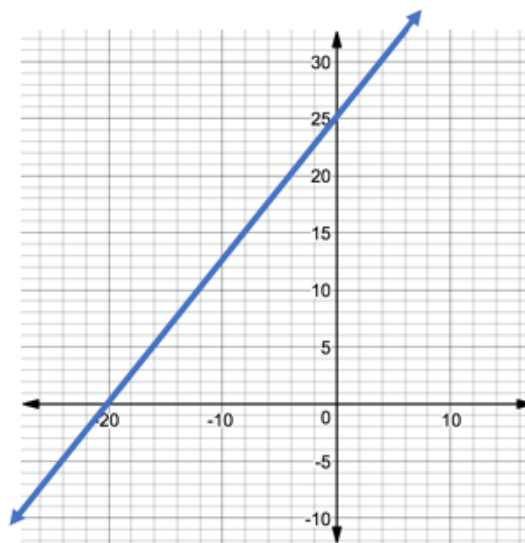
One mark should be awarded for the point-slope form $y - 150 = \frac{5}{4}(x - 100)$, $y - 525 = \frac{5}{4}(x - 400)$, or $y - 337.50 = \frac{5}{4}(x - 250)$.

If the student uses an equivalent fraction to $\frac{5}{4}$ or 1.25 as the slope, still award the mark.

- b) One mark should be awarded for the slope-intercept form $y = \frac{5}{4}x + 25$.

If the student uses an equivalent fraction to $\frac{5}{4}$ or 1.25 as the slope, still award the mark.

- c) One mark should be awarded for a line with an x -intercept of -20 and a y -intercept of 25.



- d) One mark should be awarded for the standard form $5x - 4y = -100$.

*If the student writes $-5x + 4y = 100$ or $-1.25x + y = 25$, do **not** award the mark.*

- e) One mark should be awarded for a cost of \$100.

If the student leaves out the units, still award the mark.

6 marks



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22

- a) One mark should be awarded if the student isolates the absolute value on one side of the equation.

$$|x - 2| = 7$$

One mark should be awarded if the student considers both cases, explicitly writing the two equations that satisfy each case.

$$x - 2 = 7 \text{ and } x - 2 = -7$$

One mark should be awarded if the student gives the correct solution set.

$$\{-5, 9\}$$

If the student shows $x = -5$ and $x = 9$, still award the mark.

- b) One mark should be awarded for a number line showing the numbers in the correct order.

One mark should be awarded for a closed circle on -5.

One mark should be awarded for a closed circle on 9.

If the student shades to the right, left, or in between the closed circles, only one out of the three marks should be given for the numbers in the correct order.

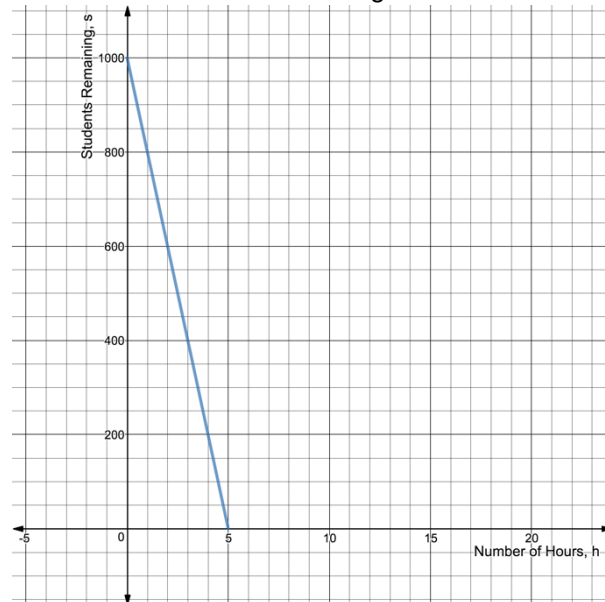
6 marks



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- a) One mark should be awarded for a zero of $(5, 0)$.
If the student identifies the zero as 5, still award the mark.
- b) One mark should be awarded for a domain of $\{0 \leq x \leq 5\}$.
*If the student states this in words **or** as $x \geq 0$ and $x \leq 5$, still award the mark.*
- c) One mark should be awarded for a line with an x -intercept of 5 and a y -intercept of 1000.

One mark should be awarded for the line meeting the conditions $0 \leq x \leq 5$.



- d) One mark should be awarded for an explanation of the zero representing the 5 hours it took for all the students to accept their diplomas.
- e) One mark should be awarded for a range of $\{0 \leq y \leq 1000\}$.
*If the student states this in words **or** as $y \geq 0$ and $y \leq 1000$, still award the mark.*

6 marks



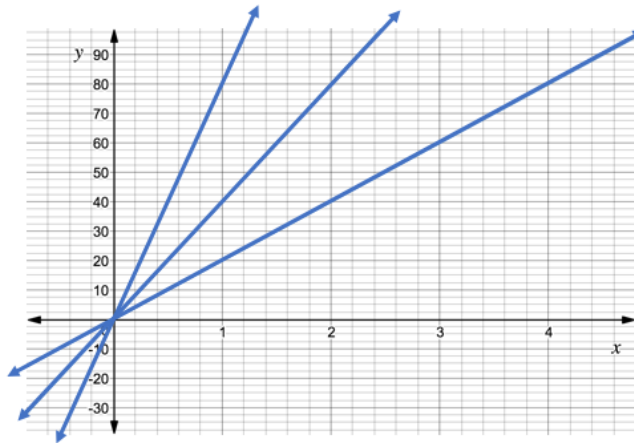
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- a) One mark should be awarded for the equation $y = 80x$.
If the student writes $y = \frac{320}{4}x$, still award the mark.

- b) One mark should be awarded for the graph of $y = 80x$ that goes through the origin and (1, 80).

One mark should be awarded for the graph of $y = 40x$ that goes through the origin and (1, 40).

One mark should be awarded for the graph of $y = 20x$ that goes through the origin and (1, 20).



- c) One mark should be awarded for an explanation detailing a constant of variation, the slope of a line, and the rate of change of a graph being equivalent in a direct variation.
- d) One mark should be awarded for an explanation that the steepest graph has to be the direct variation whose constant of variation (slope) is the greatest.

6 marks



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- a) Two marks should be awarded for $-4 \leq w < 2$.
If the student states $w \geq -4$ (or $-4 \leq w$), award one mark.
If the student states $w < 2$ (or $2 > w$), award one mark.

- b) One mark should be awarded for a closed circle on -4.

One mark should be awarded for an open circle on 2.

One mark should be awarded for shading in between -4 and 2.

*If the student shades to the left of -4, do **not** award the mark.*

*If the student shades to the right of 2, do **not** award the mark.*

- c) One mark should be awarded for stating *intersection*.

6 marks



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Data Analysis Information

Use the information below to help you determine which student learning outcomes are not being met by the majority of your students. This will help you make determinations about re-teaching, spiraling content not mastered, and implementing other interventions without interrupting the scheme of work.

Question	Lesson	Student Learning Outcome(s)
1	1-1	Write algebraic expressions for verbal expressions.
2	1-7	Determine whether a relation is a function.
3	2-1	Translate sentences into equations.
4	3-2	Solve linear equations by graphing.
5	3-6	Write an equation for a proportional relationship.
6	4-7	Find the inverse of a relation.
7	1-2	Evaluate algebraic expressions by using the order of operations.
8	1-8	Interpret intercepts and symmetry of graphs of functions.
9	2-7	Find the percent of change. Solve problems involving percent of change.
10	1-6	Interpret graphs of relations.
11	3-3	Use rate of change to solve problems. Find the slope of a line.
12	3-5	Relate arithmetic sequences to linear functions.
13	2-4	Solve equations with the variable on each side. Solve equations involving grouping symbols.
14	1-7	Find function values.
15	2-6	Solve proportions.
16	5-3	Solve linear inequalities involving more than one operation. Solve linear inequalities involving the Distributive Property.
17	1-3, 1-4, and 2-3	Solve equations involving more than one operation. Solve equations involving consecutive integers.
18	4-7	Find the inverse of a linear function.
19	3-6	Write an equation for a non-proportional relationship.
20	5-5	Solve and graph absolute value inequalities ($<$).
21	4-1 to 4-3	Write and graph linear equations in slope-intercept form. Model real-world data with equations in slope-intercept form. Write an equation of a line in slope-intercept form given two points. Write equations of lines in point-slope form. Write linear equations in different forms.
22	2-5	Solve absolute value equations.
23	3-1	Identify linear equations, intercepts, and zeros. Graph linear equations.
24	3-4	Write and graph direct variation equations. Solve problems involving direct variation.
25	5-1 to 5-4	Solve linear inequalities by using addition. Solve linear inequalities by using subtraction. Solve linear inequalities by using division. Solve linear inequalities involving more than one operation. Solve linear inequalities involving the Distributive Property. Solve compound inequalities containing the word <i>and</i> , and graph their solution set.