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1 2 3 4 5 6 7 8 9 QVS 17 16 15 14 13 12

NAME _____ DATE _____ PERIOD _____ SCORE _____

Chapter 3 Performance Task

Managing a Team

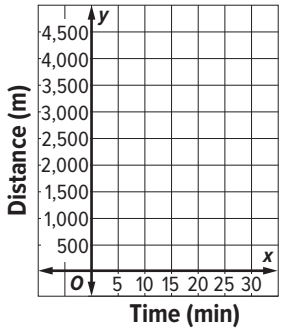
Francine and José are the managers of their school's basketball teams. One of their jobs is collecting data about the players during practices and games.

Write your answers on another piece of paper. Show all your work to receive full credit.

Part A

José keeps track of each player's training runs. The table shows a record of Damon's training run. Damon felt that he ran faster at the beginning of his run than during the last 10 minutes of his run. Graph the data and write an equation in slope-intercept form to represent Damon's run. Use your graph and equation to explain whether Damon's feelings are accurate.

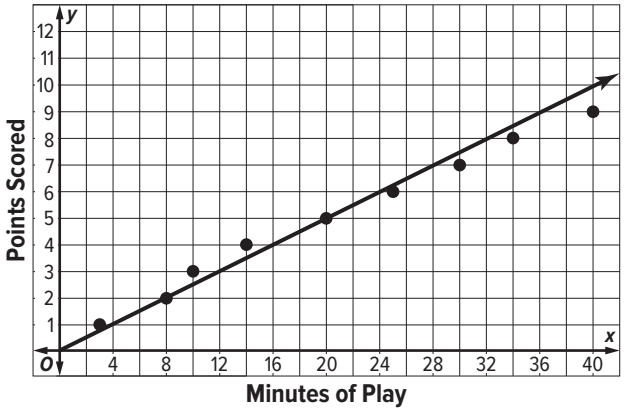
Time (min), x	Distance (m), y
0	0
5	900
10	1,800
15	2,700
20	3,600
25	4,500



Part B

Francine keeps track of how many minutes players play each game and how many points they score. Her data for Talia are shown on the graph.

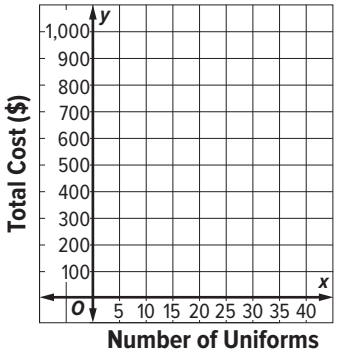
The line drawn passes through (8, 2) and (20, 5) to show the trend of the data. What is the slope of the line? Explain what the slope represents in this situation.



Both the girls' and boys' teams are heading to the regional championships. Francine and José want to raise funds to help the teams get there in style.

Part C

Francine wants to raise enough money to buy new uniforms for the 11 members of the girls' team. The Uni-Forme Company charges $22 per uniform plus a flat fee for shipping of $100. The Sports Shoppe charges $30 per uniform and offers free shipping. Write a system of equations to represent the situation. Then graph the system and use it to estimate which company offers the better price for 11 uniforms. Solve the system algebraically to verify that your estimate is correct.



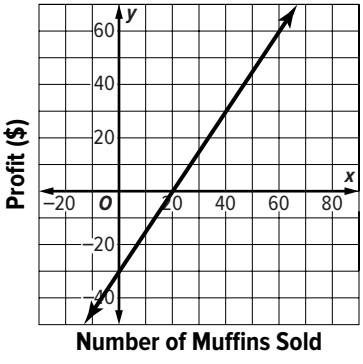
Part D

Francine realizes that she cannot order just one uniform for each team member. She needs one blue "away game" uniform and one white "home game" uniform for each of the 11 girls on the team. From which company should she order the uniforms and why? How much money will Francine save by using one company instead of the other?

Part E

José is planning to sell breakfast muffins for a fundraiser. He pays $30 for 60 muffins. He makes a graph to show the profit in dollars y he will make after selling x muffins.

Write an equation in slope-intercept form that describes José's plan. What do the slope and y-intercept represent? How many muffins must José sell to make a profit for the team?



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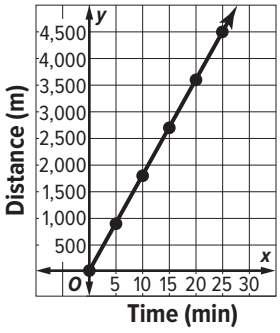
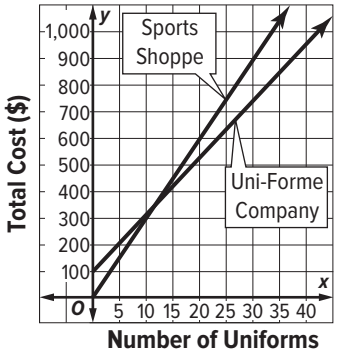
Task Scenario
Students will write, analyze, and graph linear equations and systems of linear equations to solve problems involving data related to a basketball team.

CCSS Content Standard(s)	8.EE.5, 8.EE.6, 8.EE.8, 8.EE.8a, 8.EE.8b, 8.EE.8c, 8.F.2, 8.F.3, 8.F.4, 8.F.5
Mathematical Practices	MP1, MP2, MP3, MP4, MP6, MP7
Depth of Knowledge	DOK2, DOK3

Part	Maximum Points	Scoring Rubric
A	3	Full Credit: Slope: Any 2 points in the table can be used to compute the slope. A sample is shown. $\frac{900 - 0}{5 - 0} = 180$ *y*-intercept: 0 Equation: $y = 180x$ Sample graph:  Sample answer: The graph and the equation show that the slope is the same for any two points. So Damon ran at the same speed during the entire run, not faster in the beginning. Partial Credit (2 points) will be given for 2 of these 3 answers: the correct equation OR the correct graph OR an appropriate explanation for why Damon is incorrect. Partial Credit (1 point) will be given for 1 of the 3 answers listed above. No credit will be given for an incorrect answer.
B	2	Full Credit: The slope of the line is $\frac{5 - 2}{20 - 8} = \frac{3}{12} = \frac{1}{4}$. The slope represents points scored per minute. For every 4 minutes Talia plays, she scores about 1 point. Partial Credit (1 point) will be given for the correct slope without an explanation. No credit will be given for an incorrect answer.

Part	Maximum Points	Scoring Rubric
C	3	Full Credit: System of equations: $y = 22x + 100$, $y = 30x$ Sample graph: Sports Shoppe offers a lower price for 11 uniforms. Sample check by substitution: $30x = 22x + 100$; $8x = 100$; $x = 12.5$ $y = 30(12.5) = 375$  The solution is (12.5, 375), where the costs are the same. The Sports Shoppe is cheaper for 12 or fewer uniforms. Partial Credit (1 point) will be given for each of these 3 answers: the correct system OR the correct graph OR the correct store to use and checking the answer. No credit will be given for an incorrect answer.
D	2	Full Credit: 11(2) = 22 uniforms will be needed. The solution of the system is (12.5, 375). When 13 or more uniforms are ordered, the Uni-Forme Company is cheaper. Uni-Forme: $y = 22x + 100 = 22(22) + 100 = \$584$ Sports Shoppe: $y = 30x = 30(22) = \$660$ Amount saved: $660 - 584 = \$76$ Partial Credit (1 point) will be given for the correct company OR the correct amount of money saved. No credit will be given for an incorrect answer.
E	3	Full Credit: slope = $\frac{30 - 0}{40 - 20} = \frac{3}{2} = 1.5$, y-intercept = -30 equation: $y = 1.5x - 30$ slope: the selling price per muffin, \$1.50 y-intercept: the \$30 debt for buying 60 muffins The x-intercept at (20, 0) shows that José must sell more than 20 muffins to make a profit. Partial Credit (1 point) will be given for each of these 3 answers: the correct equation OR descriptions of slope and y-intercept OR the correct profit point. No credit will be given for an incorrect answer.
TOTAL	**13**	

Chapter 3 Performance Task

Part A

Slope = $\frac{\Delta y}{\Delta x} = \frac{900-0}{5-0} = \frac{900}{5} = 180$ m/min

y-int = 0

$y = 180x$

Damean's Distance Over Time

Damean's feelings are not accurate because his run forms a straight line. That means his speed stayed constant the entire time.

Part B

Slope: $\frac{\Delta y}{\Delta x} = \frac{5-2}{20-8} = \frac{3}{12} = \frac{1}{4}$

The slope represents points scored per minute.

Talia scores 1 point every four minutes.

Part C

Uniform

x	y
0	100
5	210
30	760

$22x + 100 = y$

Sports Shoppe

x	y
0	0
5	150
10	300

x = number of uniforms

y = total cost

For 11 uniforms, I estimate that the Sports Shoppe is cheaper.

$22x + 100 = 30x$ → $12.5 = x$

$-22x \quad -22x$

$\frac{100}{8} = \frac{8x}{8}$

$30(12.5) = y$

$375 = y$

Because the companies are tied at 12.5 uniforms, less than that (11) means that the Sports Shoppe is cheaper.

Uniform Costs

Part D

Francine needs 22 uniforms. The Uniforme company will be cheaper, as you can see because the line for U.C. is lower. Also, if you do the math, you see that Francine saves $76 ($160-$84).

Uniforme	Sports Shoppe
$22x + 100 = y$	$30x = y$
$22(22) + 100 = y$	$30 \cdot 22 = y$
$584 = y$	$660 = y$

Part E

(b)

y-intercept: -30

slope: $\frac{0-30}{10-0} = \frac{30}{10} = \frac{3}{1}$

(m)

$y = mx + b$

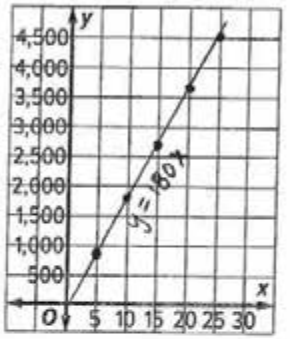
$y = \frac{3}{1}x - 30$

The y-intercept represents what Josef is $30 in debt when he starts. The slope shows the price of the muffins ($3 for every 2 muffins or $1.50). Josef must sell more than 10 muffins to make a profit.

Chapter 3 Performance Task

Part A

Training Run



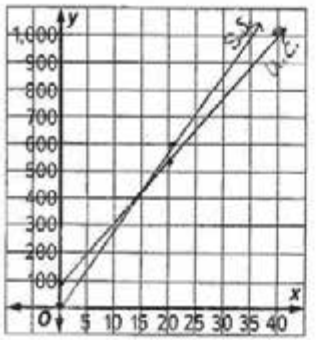
$y = \frac{900}{5}x + 0$ $y = 180x$

Dameon is wrong. He ran the same pace the whole time. The slope stays the same.

Part B

$\frac{2-5}{8-20} = \frac{-3}{-12} = \frac{-1}{-4} = \frac{1}{4}$ which means 1 point per minute

Part C



Uniforme Co $22x + 100 = y$

Sports Shoppe $30x = y$

For 11 uniforms, the sports Shoppe is better because $30(11) = 330$ and at the Uniforme CO, it costs $22(11) + 100 = 342$.

Part D

For 22 uniforms, the uniforme Company is cheaper.

Part E

$y = \frac{60}{-30}x - 30$

$y = \frac{-3}{2}x - 30$

The y intercept shows that he started $30 in debt. The slope shows that it is a negative profit per muffin. Jose' needs to sell 20 muffins.

Student Work Sample

Chapter 3 Performance Task

Part A

$\frac{4500-2700}{25-15} = \frac{1800}{10} = 180$

$\frac{1800-0}{10-0} = \frac{1800}{10} = 180$

Same pace

Part B

$\frac{20-8}{5-2} = \frac{12}{3} = 4$

4 points per minute

Part C

Uniforme Co

$22 \cdot 11 + 100 = 342$

line through (0,100) and (11,342)

Sports Shoppe

$30(11) = 330$

line through (0,0) and (11,330)

Cheaper to buy at the Sports Shoppe.

Part D

Uniforme Co

$22 \cdot 22 + 100$

684

Sports Shoppe

$30 \cdot 22$

660

Part E

Slope (40,30) (20,0)

$\frac{30-0}{40-20} = \frac{30}{20} = 1.5$

y int shows How many muffins to make a profit

y-int 20

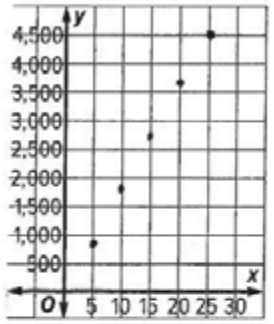
$1.5x + 20 = y$

Slope shows how # grows over time

must sell 20 muffins.

Chapter 3 Performance Task

Part A



Yes, Dameon gets faster because the numbers keep going up.

Up 2 over 1 $y = \frac{2}{1}x$

Part B

over 6 up 3 slope = $\frac{6}{3} = 2$

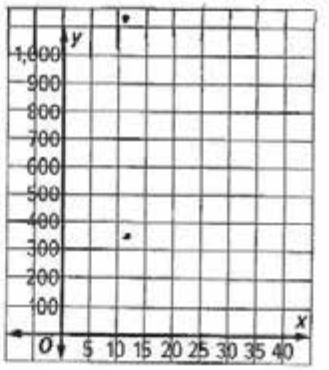
The slope is the rise over the run.

Part C

U.C. = $100x + 22 = 100 \times 11 + 22 = 1122$

S.S. = $30x = 30 \times 11 = 330$

Cheaper



Part D

U.C. $100(22) + 22 = 2200 + 22 = 2222$

S.S. $= 30(22) = 660$ ★

Part E

$\frac{2}{3}$ = slope

$30 + \frac{2}{3}y = x$

Must sell 60 muffins to make $60.

Student Work Sample