AChor/MFM2P **Name: _____**
Date: _____

Practice Test 4: Linear Relations

K: _____	C: _____	A: _____	T: _____

PART A: Multiple Choice Questions
Instructions: Circle the English letter of the best answer.
Circle one and ONLY one answer for each question.

PART B: FULL SOLUTION QUESTIONS
Instructions: Show all steps to get full mark.
Marks will be deducted for poor work or improper form.

Knowledge:

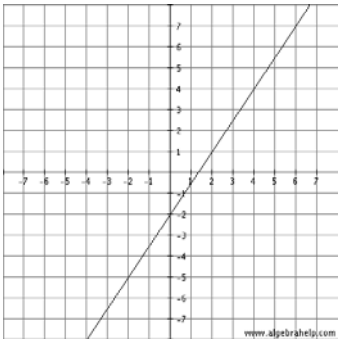
1. In which quadrant does each of the following points locate? [K: 4]
(a) (–4, 8) (b) (6, –7) (c) (–5, 0) (d) (0, –2)

2. Which one of the following equations represents a linear relation? _____ [K: 1]

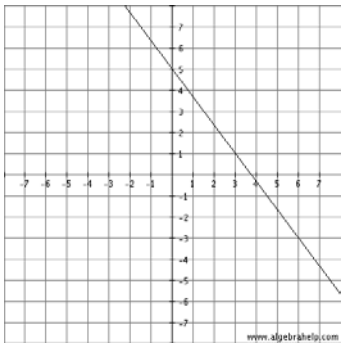
(a) $y = 4x^2 - 9$ (b) $3x + y + 8 = 0$ (c) $y = 2^x - 1$

3. Examine each of the following graphs, and state the equation of each line. [K: 6]

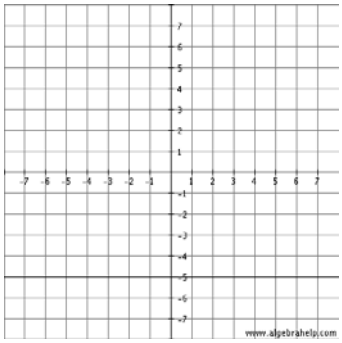
(a)



(b)



(c)



4. Examine each of the following equations, and state the slope and *y*-intercept of each line. [K: 6]

(a) $y = -3x + 7.5$ (b) $y = \frac{1}{2}x - \frac{2}{3}$ (c) $y = -5 - x$

Slope: Slope: Slope:

y-intercept: *y*-intercept: *y*-intercept:

5. Find the slope of the line that passes through the points $(3, 2)$ and $(5, -2)$. [K: 2]

6. Check if each table represents a linear relation. If so, write its equation in $y = mx + b$. [K: 8]

(a)

x	y
0	−4
2	−3
4	−2
6	−1

(b)

x	y
2	7
3	5
4	3
5	1

7. Find the equation of the line when its slope is 11 and its y-intercept is $-\frac{2}{3}$. [K: 3]

8. Find the equation of the line that passes through (–1, 3) with slope 5. [K: 5]

9. Find the equation of the line that passes through (2, –8) with x-intercept 4. [K: 8]

10. Write an equation of a line that meets each stated condition.

(a) parallel to $y = -3x + 7$ (b) steeper than $y = 4x + 1$ (c) less steep than $y = -x - 5$

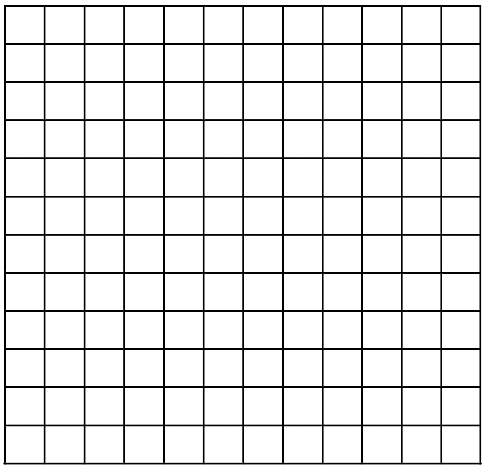
11. Find the equation of the line that is parallel to the line $y = 5x - 3$ and passes through (3, –4). [K: 6]

12. State an equation of the line that is parallel to $y = 10x + 1$ with *y*-intercept $-\frac{1}{2}$. [K: 2]

Communication:

13. Graph $y = \frac{2}{3}x - 3$ using slope and *y*-intercept ONLY.

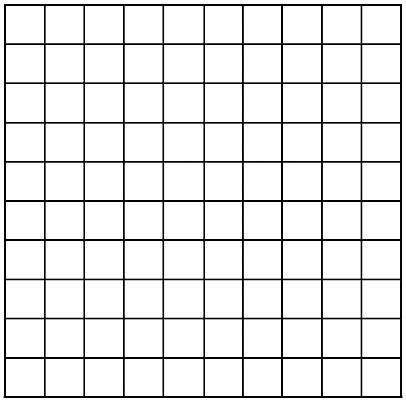
Label both axes and the line. [C: 4]
(Show the right triangles you use to graph the line. No tables!)



14. Graph $y = -\frac{1}{2}x + 3$ using a table of values.

Label both axes and the line. [C: 6]

x		(x, y)



15. Grade 3 students from Bayview Glenn P. S. are going on a trip. They are planning to go to either the zoo or the museum. The zoo charges $5 per person and bussing costs $50. The museum charges $4 person and bussing costs $65.

(a) Write a linear equation to represent the total cost of the trip to each destination. [C: 4]

(b) There are 20 students in the grade 3 class and two teachers. Should they go to the zoo or the museum in order to minimize costs? Explain your answer. [C: 4]

(c) If seven students decide not to go on the trip, should they go to the zoo or the museum in order to minimize costs? Explain your answer. [C: 4]

Thinking:

16. Find the equation of the line whose slope is undefined and passes through (2, 5). [T: 2]

17. Find the equation of the line that is parallel to the *x*-axis and passes through (–1, 3). [T: 2]

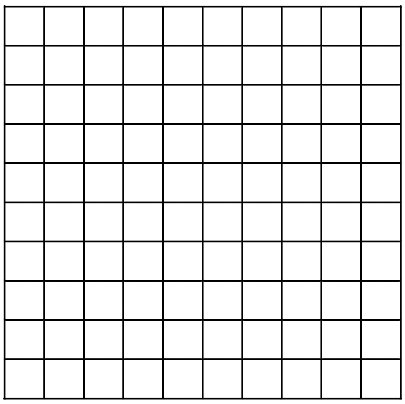
18. Line k and l pass through the points given below. If k and l are parallel, determine the value of y. [T: 4] k: (4, 3), (6, y); l: (0, 0), (1, –2)

Application:

19. A road has a grade of 8%. What is the vertical change, in metres, when the horizontal change is 10 km? [A: 3]

20. A road has a grade of 4%. What is the horizontal change, in metres, when the vertical change is 20 m? [A: 3]

21. Graph $y = 4x - 8$ using x- and y- intercepts. **Label both axes and the line.** [A: 6]



22. Find the coordinates of another possible endpoint for each line segment. [A: 6]

(a) Endpoint: (2, 1), and slope of $-\frac{1}{2}$

(b) Endpoint: (–3, 2), and slope of 0

23. A salesperson earns \$200 per week plus 10% of total sales. Write an equation to represent this relation. (Identify the independent and dependent variables.) [A: 3]

24. Surfing lessons cost \$40 per half hour and \$5 surfboard rental fee for each lesson. Write an equation to represent this relation. (Identify the independent and dependent variables.) [A: 3]

25. Monster Pizza charges \$13.75 for a pizza with one topping and \$17.25 for a pizza with 3 toppings.
(a) Write an equation relating *C*, the cost in dollars, to *t*, the number of toppings. [A: 4]

(b) If you only have \$19 for a pizza, how many toppings at the most can you order? [A: 2]

1. (a) 2nd**, (b)** 4th**, (c)** none**, (d)** none**; 2.** (b)**; 3. (a)** $y = \frac{3}{2}x - 2$**, (b)** $y = -\frac{4}{3}x + 5$**, (c)** $y = -5$**; 4. (a)** $m = -3$**,** $b = 7.5$**,**
(b) $m = \frac{1}{2}$**,** $b = -\frac{2}{3}$**, (c)** $m = -1$**,** $b = -5$**; 5.** $m = -2$**; 6. (a)** yes, $y = \frac{1}{2}x - 4$**, (b)** yes, $y = -2x + 11$**; 7.** $y = 11x - \frac{2}{3}$**;**
8. $y = 5x + 8$**; 9.** $y = 4x - 16$**; 10. (a)** $m = |3|$**, (b)** $m > |4|$**, (c)** $m < |1|$ e.g. $y = \frac{1}{3}x$**; 11.** $y = 5x - 19$**; 12.** $y = 10x - \frac{1}{2}$**;**
15.(a) museum, (b) does not matter (It depends on how many children are going on the trip. If 15 children are going, it does not matter where they go because the cost to either the zoo or the museum will be the same at \$125. If less than 15 children are going, they should go to the zoo as the cost to the zoo will be lower. If more than 15 children are going, they should go to the museum because the cost to the museum will be lower)**; 16.** $x = 2$**; 17.** $y = 3$**; 18.** $y = -1$**;**
19.800 m**; 20.** 500 m**; 21.** *x*-intercept (2, 0), *y*-intercept (0, –8)**; 22. (a)** (4, 0) or (0, 2)**, (b)** any point with 2 as the *y*-coordinate, e.g. (–2, 2), (0, 2), or (3, 2)**; 23.** $E = 0.1s + 200$**; 24.** $C = 80h + 5$**; 25. (a)** $C = 1.75t + 12$**, (b)** 4 toppings