

Sample midterm for MATH 200

1. [2 + 2 + 2 marks] Evaluate the expressions:

a.  $2 - |4 - 1|$

b.  $5(3 - 7) + 2(12 - 2)$

c.  $\frac{5}{6} + \frac{1}{3} - \frac{3}{2}$

2. [2 + 2 + 2 marks] Evaluate the following expressions for  $x = 0$  and  $y = 1$ :

a.  $5x - 2y + 1$

b.  $5(x - 2y) + 1$

c.  $5(x - 2y + 1)$

3. [3 marks] Are the following expressions equivalent? Clearly explain your answer.

$$(3 - x)(2 + y) - 4xy + 7x - 1 \quad \text{and} \quad 5x + 3y - 5xy + 5$$

4. [3 marks] Steven has an hourly salary of \$19.84. If this month he worked 84 hours, what was his salary after the 14% tax deduction?

5. [2 + 2 marks] My cell phone plan costs \$34.99 per month and includes 500 minutes. Any additional minute is charged \$0.35.

a. If I use 550 minutes, how much will my bill be?

b. If my bill this month is \$88.19, how many minutes did I use?

6. [2 + 2 + 2 + 2 + 2 marks] I want to tile a floor that measures 5 metres by 4 metres.

a. If I use square tiles that measure 20cm by 20cm, how many will I need?

b. If tiles come in a package of 30, how many packages will I need?

c. How many tiles will be left over?

d. If each package costs \$51, what is the price per tile?

e. How much money would I save if I could buy per tile instead of buying per package?

7. [2 + 2 + 2 + 2 + 2 + 2 + 2 marks]

a. Give two points that belong to the line  $y = 3x - 1$ .

b. Give two points that don't belong to the line  $y = 3x - 1$ .

c. Write the equation of the line parallel to  $y = 3x - 1$  that contains the point (1, -2).

- d. Write the equation of a line perpendicular to  $y = 3x - 1$  such that it doesn't go through the point  $(0, 0)$ .
  - e. Graph the line  $y = 3x - 1$  on a Cartesian plane. Clearly indicate in the graph the x-intercept and the y-intercept. Clearly indicate the coordinates of these two points.
  - f. Write the equation of a line that doesn't have an x-intercept. What is the slope of such line?
  - g. Write the equation of a line that doesn't have a y-intercept. What is the slope of such line?
8. [4 marks] A couple is going on a trip for 4 days and have invited a friend with his child for 2 days (the couple will pay for everything). A room in hotel H costs \$99.99 per day for two adults and they charge an extra of \$35 per day for an additional adult and \$15 per day for a child. A room in hotel K costs \$125.50 per day for up to four people. Which hotel is more convenient?

[4 marks] Bonus question: if in problem 8, the couple pays their share and the friend pays his and his child's, which hotel is more convenient for the couple? Which hotel is more convenient for the friend?

Answers:

1a. -1 ; 1b. 0 ; 1c. -2/6 ; 2a. -1 ; 2b. -9 ; 2c. -5 ; 3. Yes ; 4. 1433.24 ; 5a. \$52.49 ; 652 minutes ; 6a. 500 tiles ; 6b. 17 cases ; 6c. 10 tiles ; 6d. \$1.7 ; 6e. \$17 ; 7c.  $y = 3x - 5$  ; 7d. example:  $y = -(1/3)x + 1$  ; 7f. example:  $y = 1$ , the slope is 0 ; 7g. example:  $x = 1$ , no slope defined ; 8. Hotel A ; Bonus: hotel K is more convenient for the couple and hotel A is more convenient for the friend.