Quiz #1

1. Determine the equation of the line that passes through point $\left(\dfrac{1}{2}, -3\right)$ and is parallel to the line whose equation is $3x - 6y = 4$.

    Clearly show all your work. (10 marks)

2. Determine the equation of the line that passes through point $(3,-4)$ and is perpendicular to the line whose equation is $3x - \dfrac{2y}{3} - 4 = 0$.

Clearly show all your work. (10 marks)

3. Determine the equation of the line that passes through point $(-6,0)$ and is parallel to the line whose equation is $x - \frac{3}{5}y = -3$.

Clearly show all your work. (10 marks)

4. Determine the equation of the line that passes through point $\left(5, -\dfrac{1}{4}\right)$ and is perpendicular to the line whose equation is $4x - 5y + 3 = 0$.

Clearly show all your work. (10 marks)

Quiz #2

1. Determine the equation of the line that passes through point $\left(-\dfrac{4}{5}, 4\right)$ and is parallel to the line whose equation is $-3x - 8 = 0$.

    Clearly show all your work. (10 marks)

2. Determine the equation of the line that passes through point $\left(-3, \dfrac{2}{3}\right)$ and is parallel to the line whose equation is $-\dfrac{7}{3}y + 7 = 0$.

Clearly show all your work. (10 marks)

3. Given the following four equations:

l_1 : $\qquad 3y - 5x = 1$

l_2 : $\qquad 6x - 10y + 20 = 0$

l_3 : $\qquad 2y = 4$

l_4 : $\qquad x = 0.6y$

a) Determine whether l_1 is perpendicular to l_2. Clearly show all your work and justify it. (3 marks)

b) Find a line that is parallel to l_4. Clearly show all your work and justify it. (3 marks)

c) Determine what line is concurrent with l_2 in its y-intercept. Clearly show all your work and justify it. (4 marks)

4. Given the following four equations:

l_1 : $\dfrac{-2}{3}x = 2$

l_2 : $-3y + 12x = 10$

l_3 : $-9x - 3y + 3 = 0$

l_4 : $-x - 4y = 15$

a) Determine whether l_2 is perpendicular to l_4. Clearly show all your work and justify it. (3 marks)

b) Find a line that is parallel to l_3. Clearly show all your work and justify it. (3 marks)

c) Determine what line is concurrent with l_1 in point $(-3, -3)$. Clearly show all your work and justify it. (4 marks)

<u>Quiz</u> #3

1. Calculate the distance between points C $(7,-9)$ and D $(-8,11)$. Round off your answer to the nearest hundredth, if necessary. Show all the steps in the solution.

2. Calculate the distance between points A $(-2,3)$ and B $(4,-7)$. Round off your answer to the nearest hundredth, if necessary. Show all the steps in the solution.

3. The following expressions represent the distance between two points.

1) $\sqrt{(6+4)^2 + (0+5)^2}$

2) $\sqrt{(-1+4)^2 + (-5+5)^2}$

3) $|4-7|$

4) $\sqrt{(6+1)^2 + (0+5)^2}$

5) $\sqrt{(-5-6)^2 + (-4-0)^2}$

Points A $(-1,-5)$, B $(6,0)$, and C $(-4,-5)$ were used to define the segments below. Determine which expression(s) correspond(s) to each segment. Write the number for the expression in the space provided. (5 marks)
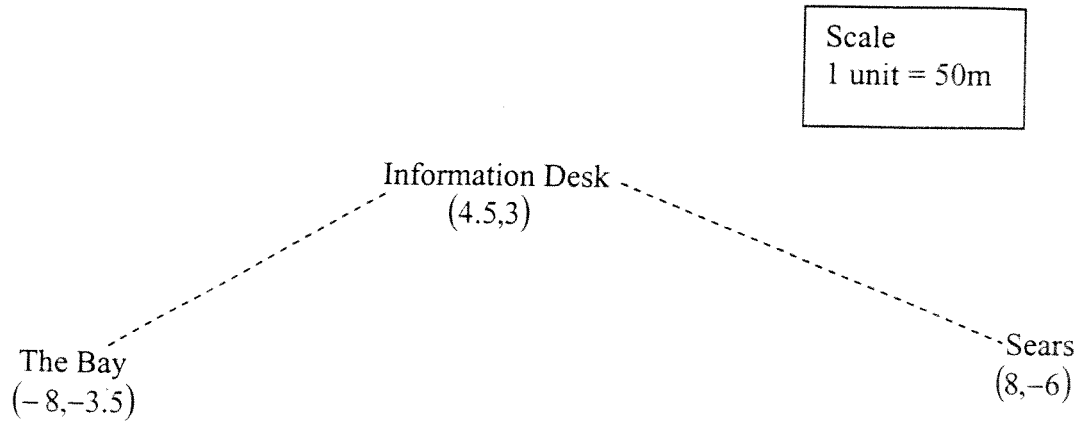
a) $\overline{AC}$ _____

b) $\overline{BA}$ _____
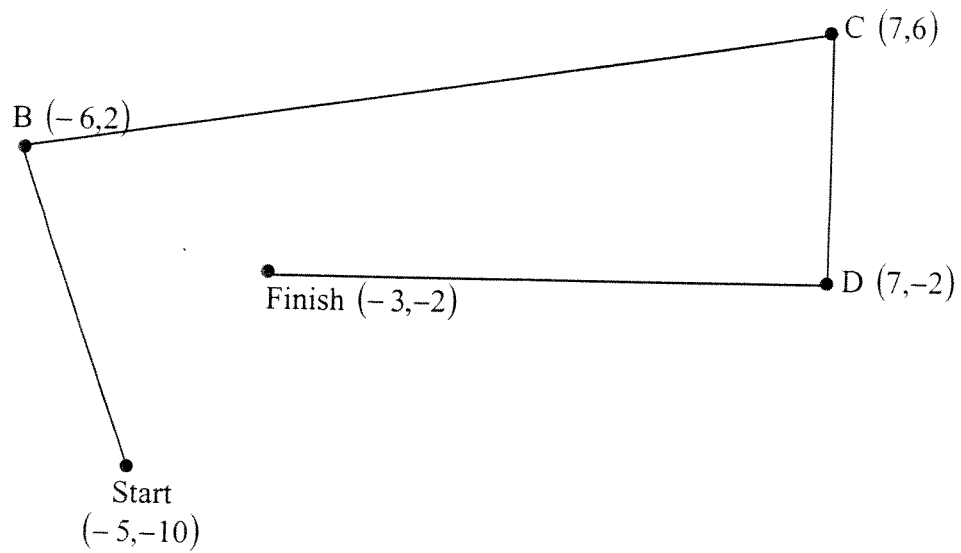
c) $\overline{BC}$ _____

4. Mary is standing at the information desk in Fairview Shopping Centre. She needs to make two purchases – one at The Bay and one at Sears. She consults a map of the mall and realizes that these two department stores are in opposite directions, and that the only path between these stores passes by the information desk. What distance will Mary cover if she wants to go to The Bay, and then back to Sears?

Clearly show all your work. (10 marks)

Scale
1 unit = 50m

Information Desk
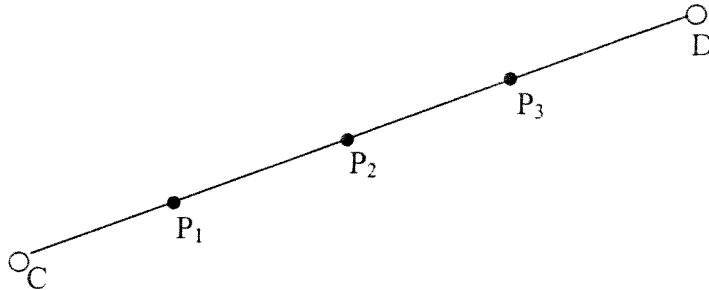(4.5,3)

The Bay
(−8,−3.5)

Sears
(8,−6)

5. Adam takes part in a marathon one weekend. Given the coordinates of the key points along the way and the fact that one unit corresponds to 500m, determine the length of the marathon.

Clearly show all your work. (10 marks)

C (7,6)

B (-6,2)

Finish (-3,-2)

D (7,-2)

Start
(-5,-10)

Quiz #4

1.   Points P_1, P_2, and P_3 divide segment $\overline{CD}$ into four equal parts.

Determine the point that corresponds to each statement below. (5 marks)

a)   Divides $\overline{P_1D}$ in a ratio of $\dfrac{1}{2}$ _____

b)   Divides $\overline{DC}$ in a ratio of $\dfrac{3}{1}$ _____

c)   Is located $\dfrac{3}{4}$ of the way along $\overline{CD}$ _____

d)   Divides $\overline{CP_3}$ in a ratio of $\dfrac{2}{1}$ _____

e)   Is located two-thirds of the way along $\overline{DP_1}$ _____

2. Points P_1, P_2, P_3, and P_4 divide segment $\overline{AB}$ into five equal parts.
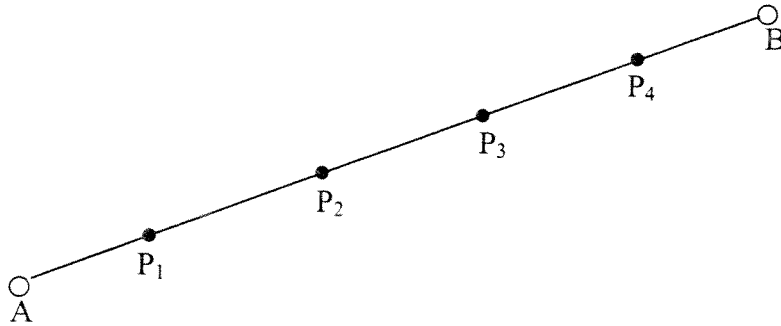
Determine the point that corresponds to each statement below. (5 marks)

a) Divides $\overline{BA}$ in a ratio of $\dfrac{3}{2}$ _____

b) Is located $\dfrac{2}{5}$ of the way along $\overline{BA}$ _____

c) Is located at the midpoint of $\overline{P_1 B}$ _____

d) Divides $\overline{AP_4}$ in a ratio of $\dfrac{1}{3}$ _____

e) Divides $\overline{P_4 P_1}$ in a ratio of $\dfrac{2}{1}$ _____
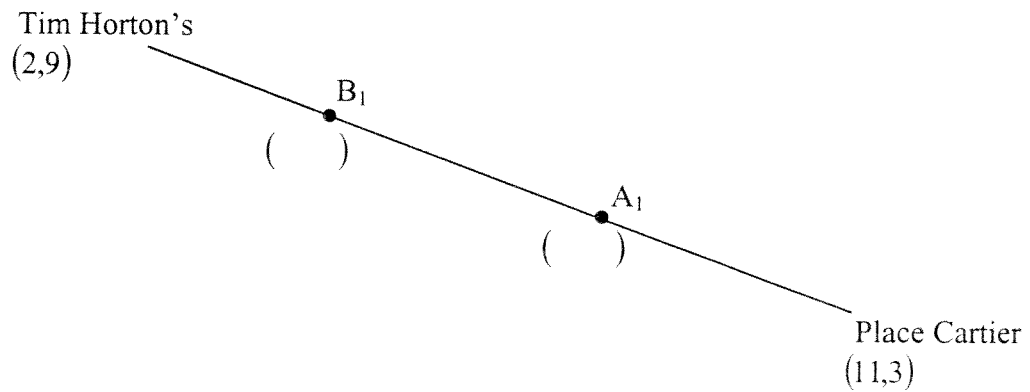
3. Calculate the coordinates of the point that divides segment $\overline{ST}$ in a ratio of $\dfrac{3}{4}$. The coordinates of point S are $(2,-4)$ and those of point T are $(-5,5)$. Show all the steps in the solution. (5 marks)

4. Calculate the coordinates of the point that divides segment $\overline{YZ}$ in a ratio of $\dfrac{6}{7}$. The coordinates of point Y are $(-2,-8)$ and those of point Z are $(11,5)$. Show all the steps in the solution. (5 marks)

5. Two friends (one is at the Tim Horton's on St. Charles Blvd, and one is at Place Cartier) decide via their cell phones that they will walk to meet each other. After ten minutes, the first friend (Friend A) has covered $\frac{2}{5}$ of the total distance from Cartier to Tim Horton's. Friend A is now at point A_1. By this time, Friend B (walking south from the Tim Horton's) has reached a point (B_1) that divides the total distance in a ratio of $\frac{1}{2}$.

One unit corresponds to 200 m. Determine the distance between the friends at the end of ten minutes of walking by identifying the coordinates of points A_1 and B_1.
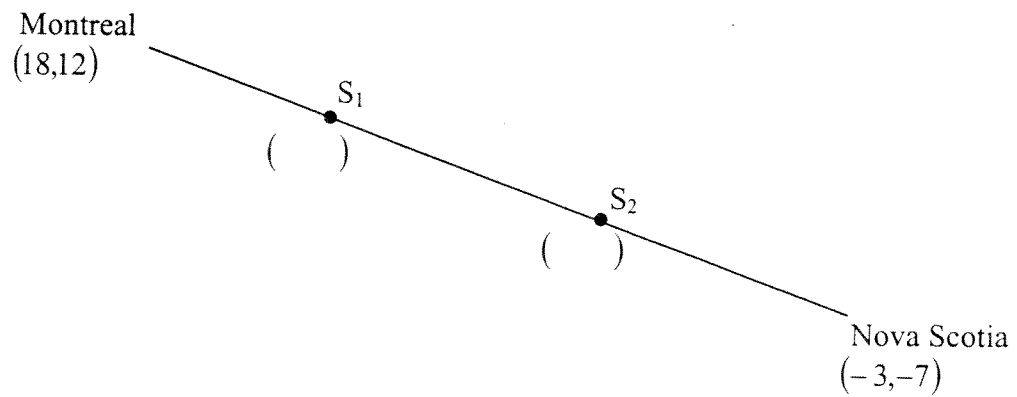
Clearly show all your work. (10 Marks)

Tim Horton's
(2,9)

B_1
(   )

A_1
(   )

Place Cartier
(11,3)

6. During a trip from Montreal to Nova Scotia, the Chisholm family made two stops. They made their first stop (S$_1$) one-third of the way to the Nova Scotia border and the second stop (S$_2$) after covering $\dfrac{4}{5}$ of the total distance.

One unit corresponds to 50 km. Determine the distance between the two stops $(S_1 - S_2)$ by identifying the coordinates of points S$_1$ and S$_2$.

Clearly show all your work. (10 marks)

Montreal
$(18,12)$

S$_1$
(   )

S$_2$
(   )

Nova Scotia
$(-3,-7)$

7. A cycling club decides to cycle from Montreal to Quebec City. Their trip is expected to take a few days.

On the first day, they reach a point (Point *B*) that divides the total distance in a ratio of $\frac{3}{7}$.

On the second day, they cover one-third of the remaining distance (to reach Point *C*).

One unit corresponds to 8 km. Determine the distance they have left to cover to reach Quebec City (Point *C* – Quebec City) by identifying the coordinates of points *B* and *C*.

Clearly show all your work.

Quebec City
(11,7)

C (   )

B (   )

Montreal
(−18,−13)

8. Margaret and Kevin are climbing to the top of Mont Tremblant. They are taking two different routes to see who gets to the top first. The diagram below shows the path each of them will take, as well as the coordinates of their starting points and of the summit.

Top (5,12)

X

Y

Margaret's start
(8,4)

Kevin's start
(−3,0)

After a morning of hiking, Kevin has covered half the distance to the summit. He then sits down to eat his lunch. Margaret, having injured her ankle, hasn't made as much progress. She notes that after she eats her lunch, she will have to hike twice the distance already covered in order to reach the summit before the end of the day.

One unit corresponds to 200 m. Determine the distance between Margaret and Kevin as they eat their lunches by identifying the coordinates of points X and Y.
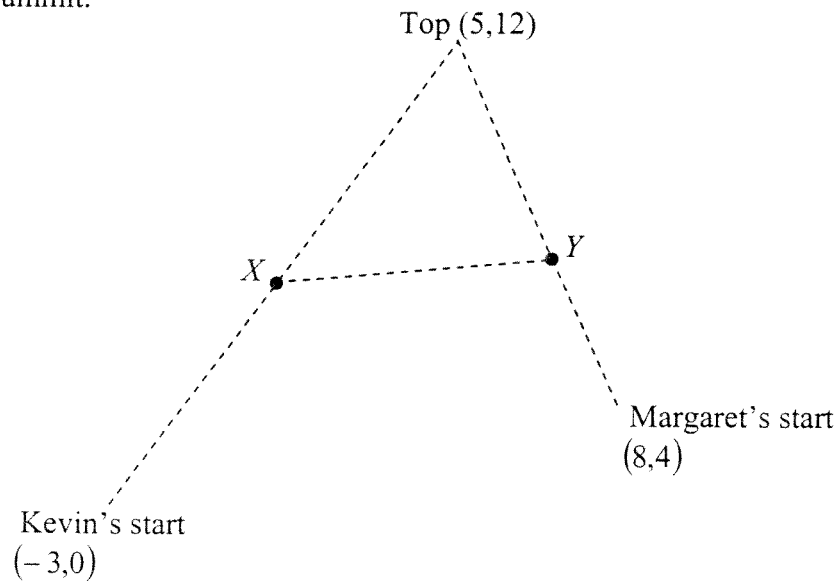
Clearly show all your work.

Quiz #5

1. In triangle ABC, angle B is a right angle. The coordinates of A are (-16,0) and those of B are (0,12). Determine the length of the base AC given that point C is located on the x-axis.

    Clearly show all your work. Show all the steps in the solution. (10 Marks)

2. Lines l_1 and l_2 are perpendicular to line l_3 whose equation is $3x + 5y - 12 = 0$. They intersect l_3 at its intercepts.

Determine the equation of the line that is equidistant from the two parallel lines.

Clearly show all your work. (10 marks)

NAME: _Shannon_

DATE: _____

<u>Quiz #1</u>

1.   Determine the equation of the line that passes through point $\left(\frac{1}{2}, -3\right)$ and is parallel to the line whose equation is $3x - 6y = 4$.

Clearly show all your work. (10 marks)

$\underline{\ell_1}$

$3x - 6y = 4$

$\dfrac{-6y}{-6} = \dfrac{-3x}{-6} + \dfrac{4}{-6}$

$y = \boxed{\frac{1}{2}} x - \frac{2}{3}$

$m = \frac{1}{2}$
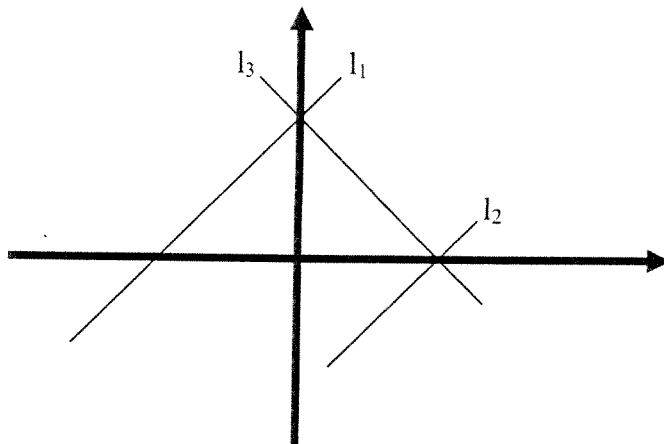
$\underline{\ell_2}$

$m = \frac{1}{2}$ $\left(\frac{1}{2}, -3\right)$

$y = mx + b$

$-3 = \left(\frac{1}{2}\right)\left(\frac{1}{2}\right) + b$

$-3 = \frac{1}{4} + b$

$-3\frac{1}{4} = b$

$\boxed{y = \frac{1}{2} x - 3\frac{1}{4}}$

NAME: _Shannon_

DATE: _____

Quiz

2. Determine the equation of the line that passes through point $(3,-4)$ and is perpendicular to the line whose equation is $3x - \dfrac{2y}{3} - 4 = 0$.

Clearly show all your work. (10 marks)

$\underline{\ell_1}$

$3x - \dfrac{2y}{3} - 4 = 0$

$\left(-\dfrac{3}{2}\right) - \dfrac{2}{3}y = \left(-3x + 4\right)\dfrac{-3}{2}$

$y = \boxed{\dfrac{9}{2}}x - 6$

$\underline{\ell_2}$

$m = -\dfrac{2}{9}$

$(3, -4)$

$y = mx + b$

$-4 = \left(-\dfrac{2}{9}\right)\left(\dfrac{3}{1}\right) + b$

$-4 = \dfrac{-6}{9} + b$

$-4 + \dfrac{6}{9} = b$

$-3\dfrac{1}{3} = b$

$\boxed{y = -\dfrac{2}{9}x - 3\dfrac{1}{3}}$

3. Determine the equation of the line that passes through point $(-6, 0)$ and is parallel to the line whose equation is $x - \dfrac{3}{5}y = -3$.

Clearly show all your work. (10 marks)

$\underline{\ell_2}$

$x - \dfrac{3}{5}y = -3$

$\left(\dfrac{-5}{3}\right) -\dfrac{3}{5}y = -x - 3\left(\dfrac{-5}{3}\right)$

$y = \boxed{\dfrac{5}{3}}x + 5$

$\underline{\ell_1}$

$m = \dfrac{5}{3}$

$(-6, 0)$

$y = mx + b$

$0 = \left(\dfrac{5}{3}\right)(-6) + b$

$0 = -\dfrac{30}{3} + b$

$0 = -10 + b$

$10 = b$

$\boxed{y = \dfrac{5}{3}x + 10}$

4. Determine the equation of the line that passes through point $\left(5,-\frac{1}{4}\right)$ and is

perpendicular to the line whose equation is $4x-5y+3=0$.

Clearly show all your work. (10 marks)

$\underline{\ell_1}$

$4x-5y+3=0$

$\dfrac{-5y}{-5} = \dfrac{-4x}{-5} - \dfrac{3}{-5}$

$y = \boxed{\dfrac{4}{5}}x + \dfrac{3}{5}$

$m=$

$\underline{\ell_2}$

$m = \dfrac{-5}{4}$

$y = mx + b$

$-\dfrac{1}{4} = \left(\dfrac{-5}{4}\right)\left(\dfrac{5}{1}\right) + b$

$-\dfrac{1}{4} = \dfrac{-25}{4} + b$

$-\dfrac{1}{4} + \dfrac{25}{4} = b$

$6 = b$

$y = -\dfrac{5}{4}x + 6$

NAME: _Shanno_

DATE:_____

Quiz #2

1. Determine the equation of the line that passes through point $\left(-\dfrac{4}{5}, 4 \right)$ and is parallel to the line whose equation is $-3x - 8 = 0$.

Clearly show all your work. (10 marks)

$\underline{\ell_1}$

$-3x - 8 = 0$

$\dfrac{-3x}{-3} = \dfrac{8}{-3}$

$x = -\dfrac{8}{3}$

Vertical line

ANS : $\boxed{x = \dfrac{-4}{5}}$

2. Determine the equation of the line that passes through point $\left(-3, \frac{2}{3}\right)$ and is parallel to the line whose equation is $-\frac{7}{3}y + 7 = 0$.

Clearly show all your work. (10 marks)

$$\underline{\ell_1}$$

$$-\frac{7}{3}y + 7 = 0$$

$$\left(\frac{-3}{7}\right) -\frac{7}{3}y = -7\left(\frac{-3}{7}\right)$$

$$y = \frac{21}{7}$$

$$y = 3$$

horizontal line

ANS: $\boxed{y = \frac{2}{3}}$

NAME: _Shannon_

DATE: _____

Quiz

3 P. Given the following four equations:

l_1 : $3y - 5x = 1$

l_2 : $6x - 10y + 20 = 0$

l_3 : $2y = 4$

l_4 : $x = 0.6y$

a) Determine whether l_1 is perpendicular to l_2. Clearly show all your work and justify it. (3 marks)

$l_1 :$ $3y - 5x = 1$

$\dfrac{3y}{3} = \dfrac{5x}{3} + \dfrac{1}{3}$

$y = \left(\dfrac{5}{3}\right)x + \dfrac{1}{3}$

$l_2 :$ $6x - 10y + 20 = 0$

$\dfrac{-10y}{-10} = \dfrac{-6x}{-10} - \dfrac{20}{-10}$

$y = \left(\dfrac{3}{5}\right)x + 2$

No, l_1 is not perpendicular to l_2 since

$m l_1 \cdot m l_2 \neq -1$

b) Find a line that is parallel to l_4. Clearly show all your work and justify it. (3 marks)

$l_4 :$ $x = 0.6y$

$\dfrac{-0.6y}{-0.6} = \dfrac{-1x}{-0.6}$

$y = 1\frac{2}{3}x$

$y = \dfrac{5}{3}x$

$l_1 \parallel l_4$

Since both have a slope $= \dfrac{5}{3}$

c) Determine what line is concurrent with l_2 in its y-intercept. Clearly show all your work and justify it. (4 marks)

$l_2 :$ y-intercept $= 2$ $\rightarrow$ $(0, 2)$

$l_3 :$ $\dfrac{2y}{2} = \dfrac{4}{2}$

$y = 2$ $\rightarrow$ also passes through $(0, 2)$

$\rightarrow l_3$ is concurrent with l_2 in its y-intercept.

4. Given the following four equations:

$l_1:$ $\dfrac{-2}{3}x = 2$ $\rightarrow$ Vertical line, $m =$ undefined.

$l_2:$ $-3y + 12x = 10$

$l_3:$ $-9x - 3y + 3 = 0$

$l_4:$ $-x - 4y = 15$

a) Determine whether l_2 is perpendicular to l_4. Clearly show all your work and justify it. (3 marks)

$l_2:$ $-3y + 12x = 10$
$$\dfrac{-3y}{-3} = \dfrac{-12x}{-3} + \dfrac{10}{-3}$$
$$y = 4x - \dfrac{10}{3}$$

$l_4:$ $-x - 4y = 15$
$$\dfrac{-4y}{-4} = \dfrac{x}{-4} + \dfrac{15}{-4}$$
$$y = -\dfrac{1}{4}x - \dfrac{15}{4}$$

Yes, $l_2 \perp l_4$ since $m l_2 \cdot m l_4 =$

b) Find a line that is parallel to l_3. Clearly show all your work and justify it. (3 marks)

$l_3:$ $-9x - 3y + 3 = 0$
$$\dfrac{-3y}{-3} = \dfrac{9x}{-3} - \dfrac{3}{-3}$$
$$y = -3x + 1$$

There is no line parallel to l_3.

c) Determine what line is concurrent with l_1 in point $(-3, -3)$. Clearly show all your work and justify it. (4 marks)

$l_4:$ $-x - 4y = 15$
$$-(-3) - 4(-3) = 15$$
$$3 + 12 = 15 \checkmark$$

l_4 is concurrent with l_1 in point $(-3, -3)$.

NAME: _Shannon_
DATE: _____

Quiz # 3

1. Calculate the distance between points C $(7,-9)$ and D $(-8,11)$. Round off your answer to the nearest hundredth, if necessary. Show all the steps in the solution.

$$d = \sqrt{(11+9)^2 + (-8-7)^2}$$

$$= \sqrt{20^2 + (-15)^2}$$

$$= \sqrt{400 + 225}$$

$$= \sqrt{625}$$

$$= \boxed{25 \text{ units}}$$

2. Calculate the distance between points A $(-2,3)$ and B $(4,-7)$. Round off your answer to the nearest hundredth, if necessary. Show all the steps in the solution.

$$d = \sqrt{(-7-3)^2 + (4+2)^2}$$

$$= \sqrt{(-10)^2 + (6)^2}$$

$$= \sqrt{100 + 36}$$

$$= \sqrt{136}$$

$$= \boxed{11.66 \,\cup}$$

NAME: _Shannon_

DATE:_____

Quiz

3, The following expressions represent the distance between two points.

1) $\sqrt{(6+4)^2 + (0+5)^2}$

2) $\sqrt{(-1+4)^2 + (-5+5)^2}$

3) $|4-7|$

4) $\sqrt{(6+1)^2 + (0+5)^2}$

5) $\sqrt{(-5-6)^2 + (-4-0)^2}$

Points A $(-1-5)$, B $(6,0)$, and C $(-4-5)$ were used to define the segments below. Determine which expression(s) correspond(s) to each segment. Write the number for the expression in the space provided. (5 marks)

a) $\overline{AC}$ _3, 2_

b) $\overline{BA}$ _4_

c) $\overline{BC}$ _1_

$\overline{AC} : \sqrt{(-5+5)^2 + (-4+1)^2}$

$= \sqrt{0^2 + (-3)^2}$

$= \sqrt{9} \quad = 3$

$\overline{BA} : \sqrt{(0+5)^2 + (6+1)^2}$

$= \sqrt{(5)^2 + (7)^2}$

$\overline{BC} = \sqrt{(-5-0)^2 + (-4-6)^2}$

$= \sqrt{(-5)^2 + (-10)^2}$

NAME: Shannru

DATE:

Quiz

4. Mary is standing at the information desk in Fairview Shopping Centre. She needs to make two purchases – one at The Bay and one at Sears. She consults a map of the mall and realizes that these two department stores are in opposite directions, and that the only path between these stores passes by the information desk. What distance will Mary cover if she wants to go to The Bay, and then back to Sears?

Clearly show all your work. (10 marks)

Scale
1 unit = 50m

Information Desk
(4.5,3)

The Bay
(−8,−3.5)
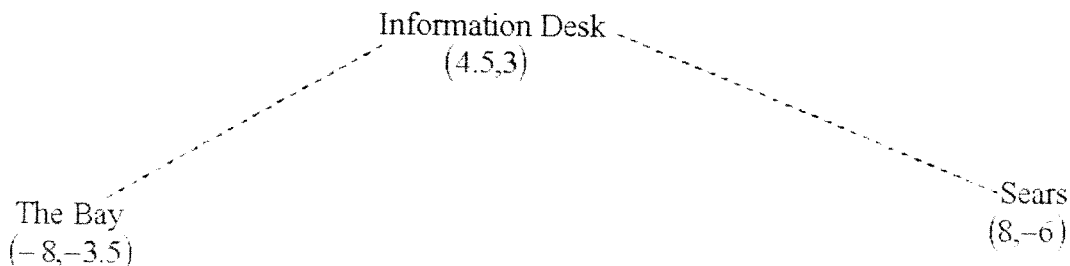
Sears
(8,−6)

distance Info Desk → Bay

$d = \sqrt{(3+3.5)^2 + (4.5+8)^2}$

$= \sqrt{(6.5)^2 + (12.5)^2}$

$= \sqrt{42.25 + 156.25}$

$= \sqrt{198.5}$

$= 14.089 \times 2 = 28.178 \, \text{u}$

Info desk → Sears

$d = \sqrt{(-6-3)^2 + (8-4.5)^2}$

$= \sqrt{(-9)^2 + (3.5)^2}$

$= \sqrt{81 + 12.25}$

$= \sqrt{93.25}$

$= 9.66 \, \text{u}$

$28.178 + 9.66 = 37.83 \, \text{u} \times 50 \text{m}$

$\boxed{1891.73 \, \text{m}}$

5. Adam takes part in a marathon one weekend. Given the coordinates of the key points along the way and the fact that one unit corresponds to 500m, determine the length of the marathon.

Clearly show all your work. (10 marks)

$d = \sqrt{(6-2)^2 + (7+6)^2}$
$= \sqrt{4^2 + 13^2}$
$= \sqrt{16+169} = 13.60 u$

C (7,6)

$d = \sqrt{(6+2)^2 + (7-7)^2}$
$= \sqrt{8^2}$
$= 8 u$

B (−6,2)

D (7,−2)

Finish (−3,−2)

$d = \sqrt{(-2+2)^2 + (7+3)^2}$
$= \sqrt{0^2 + 10^2}$
$= 10 u$

$d = \sqrt{(2+10)^2 + (-6+5)^2}$
$= \sqrt{12^2 + (-1)^2}$
$= \sqrt{144+1}$
$= \sqrt{145}$
$= 12.04 u$

Start (−5,−10)
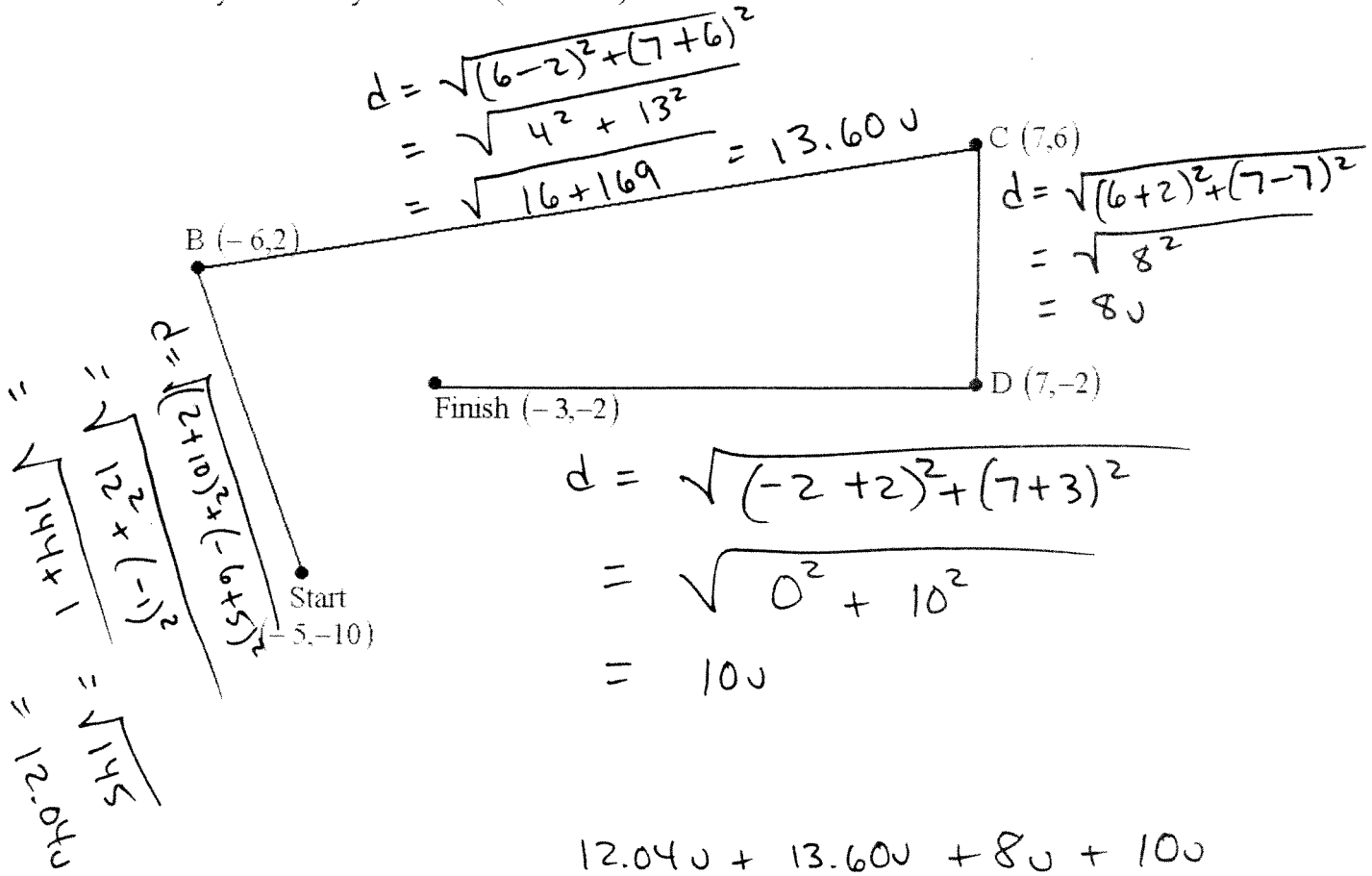
$12.04 u + 13.60 u + 8 u + 10 u$

$= 43.64 u \times 500m$

$= 21820 m$

or $21.82 Km$
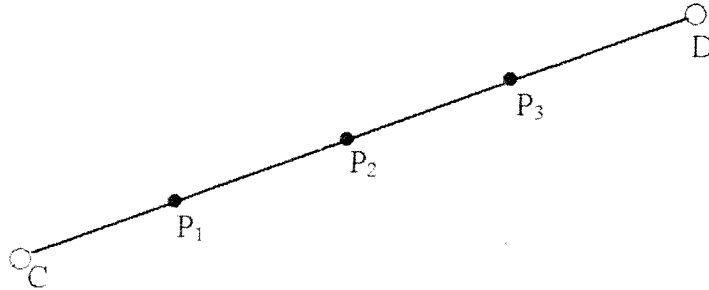
NAME: *Shannon*

DATE: _____

Quiz #4

1.   Points P_1, P_2, and P_3 divide segment $\overline{CD}$ into four equal parts.

Determine the point that corresponds to each statement below. (5 marks)

a)   Divides $\overline{P_1D}$ in a ratio of $\dfrac{1}{2}$ P_2

b)   Divides $\overline{DC}$ in a ratio of $\dfrac{3}{1}$ P_1

c)   Is located $\dfrac{3}{4}$ of the way along $\overline{CD}$ P_3

d)   Divides $\overline{CP_3}$ in a ratio of $\dfrac{2}{1}$ P_2

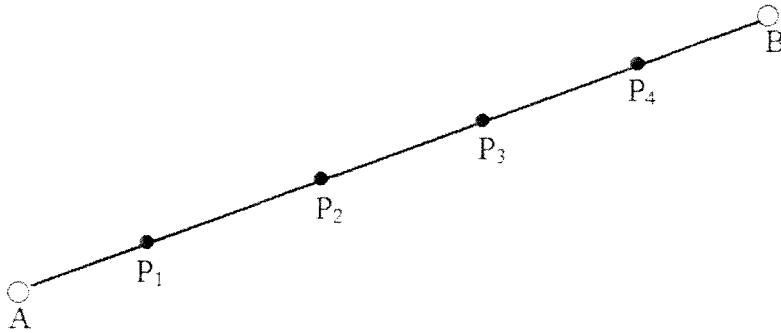e)   Is located two-thirds of the way along $\overline{DP_1}$ P_2

2. Points P_1, P_2, P_3, and P_4 divide segment $\overline{AB}$ into five equal parts.

Determine the point that corresponds to each statement below. (5 marks)

a) Divides $\overline{BA}$ in a ratio of $\dfrac{3}{2}$ P_2

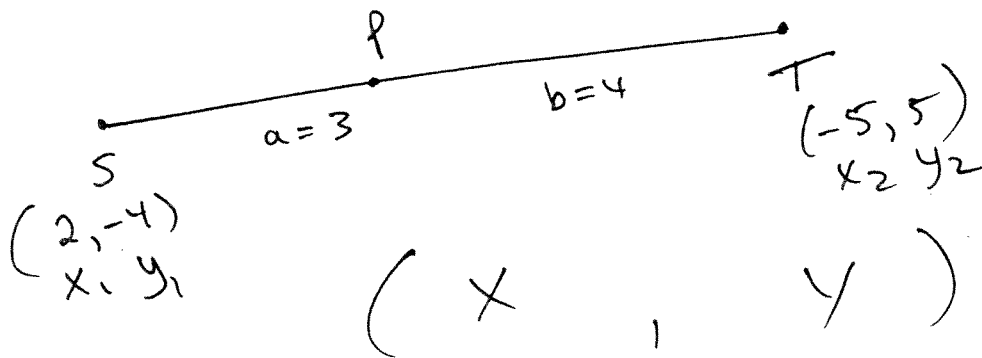b) Is located $\dfrac{2}{5}$ of the way along $\overline{BA}$ P_3

c) Is located at the midpoint of $\overline{P_1B}$ P_3

d) Divides $\overline{AP_4}$ in a ratio of $\dfrac{1}{3}$ P_1

e) Divides $\overline{P_4P_1}$ in a ratio of $\dfrac{2}{1}$ P_2

NAME: _Shannu_

DATE: _____

Quiz

3. Calculate the coordinates of the point that divides segment $\overline{ST}$ in a ratio of $\frac{3}{4}$. The coordinates of point S are $(2,-4)$ and those of point T are $(-5,5)$. Show all the steps in the solution. (5 marks)

$$\ell$$

$$b = 4$$

$$a = 3$$

$$T \quad (-5,5)$$
$$x_2 \quad y_2$$

$$S$$
$$(2,-4)$$
$$x_1 \quad y_1$$

$$(\quad x \quad , \quad y \quad)$$

$$\frac{a x_2 + b x_1}{a+b}$$

$$\frac{(3)(-5)+(4)(2)}{3+4}$$

$$\frac{-15+8}{7}$$

$$\frac{-7}{7}$$

$$\frac{a y_2 + b y_1}{a+b}$$

$$\frac{(3)(5)+(4)(-4)}{7}$$

$$\frac{15-16}{7}$$

$$\frac{-1}{7}$$

$$\left(-1 , -\frac{1}{7}\right)$$

4. Calculate the coordinates of the point that divides segment $\overline{YZ}$ in a ratio of $\dfrac{6}{7}$. The coordinates of point Y are $(-2,-8)$ and those of point Z are $(11,5)$. Show all the steps in the solution. (5 marks)

P

$b=7$

Z
$(11,5)$
$x_2 \, y_2$

$a=6$

Y
$(-2,-8)$
$x_1 \, y_1$

$\left(X \quad , \quad Y \right)$

$$\dfrac{a x_2 + b x_1}{a+b} \qquad \dfrac{a y_2 + b y_1}{a+b}$$

$$\dfrac{(6)(11)+(7)(-2)}{6+7} \qquad \dfrac{(6)(5)+(7)(-8)}{6+7}$$

$$\dfrac{66+(-14)}{13} \qquad \dfrac{30-56}{13}$$

$$\dfrac{52}{13} \; , \qquad \dfrac{-26}{13}$$

$$\boxed{(4,-2)}$$

5. Two friends (one is at the Tim Horton's on St. Charles Blvd, and one is at Place Cartier) decide via their cell phones that they will walk to meet each other. After ten minutes, the first friend (Friend A) has covered $\frac{2}{5}$ of the total distance from Cartier to Tim Horton's. Friend A is now at point A_1. By this time, Friend B (walking south from the Tim Horton's) has reached a point (B_1) that divides the total distance in a ratio of $\frac{1}{2}$.

One unit corresponds to 200 m. Determine the distance between the friends at the end of ten minutes of walking by identifying the coordinates of points A_1 and B_1.

Clearly show all your work. (10 Marks)

$$d = \sqrt{\left(7 - \frac{27}{5}\right)^2 + \left(5 - \frac{37}{5}\right)^2}$$

$$= \sqrt{2.56 + 5.76}$$

$$= 2.88 \cup \times 200m$$

$$\boxed{= 576.89\,m}$$

Tim Horton's
(2,9)
x,y

B_1

$a = 1$
$b = 2$

B_1 (5,7)

A_1 $\left(\frac{37}{5}, \frac{27}{5}\right)$

$a = 2$
$b = 3$

Place Cartier
(11,3)
x_1, y_1

$$\frac{ax_2 + bx_1}{a+b} \;,\; \frac{ay_2 + by_1}{a+b}$$

$$\frac{(1)(11) + (2)(2)}{3} \;,\; \frac{(1)(3) + (2)(9)}{3}$$

$$\frac{11 + 4}{3} \;,\; \frac{3 + 18}{3}$$

$$\frac{15}{3} \;,\; \frac{21}{3}$$

$$(5, 7)$$

$A_1 :$

$$\frac{ax_2 + bx_1}{a+b} \;,\; \frac{ay_2 + by_1}{a+b}$$

$$\frac{(2)(2) + (3)(11)}{5} \;,\; \frac{(2)(9) + (3)(3)}{5}$$

$$\frac{4 + 33}{5} \;,\; \frac{18 + 9}{5}$$

$$\left(\frac{37}{5} \;,\; \frac{27}{5}\right)$$

NAME: Shannon
DATE:

Quiz

6. During a trip from Montreal to Nova Scotia, the Chisholm family made two stops. They made their first stop (S_1) one-third of the way to the Nova Scotia border and the second stop (S_2) after covering $\dfrac{4}{5}$ of the total distance.

One unit corresponds to 50 Km. Determine the distance between the two stops ($S_1 - S_2$) by identifying the coordinates of points S_1 and S_2.

Clearly show all your work. (10 marks)

Montreal
(18,12)
x_1, y_1

$a = 1$
$b = 2$

S_1
$(11, 5\frac{2}{3})$

S_2
$(\frac{6}{5}, 3\frac{1}{5})$

Nova Scotia
$(-3, -7)$
x_2, y_2

S_1:

$$\frac{x}{\frac{ax_2 + bx_1}{a+b}} \qquad \frac{y}{\frac{ay_2 + by_1}{a+b}}$$

$$\frac{(1)(-3)+(2)(18)}{3}, \quad \frac{(1)(-7)+(2)(12)}{3}$$

$$\frac{-3+36}{3}, \quad \frac{-7+24}{3}$$

$$\frac{33}{3}, \quad \frac{17}{3}$$

$$\left(11, 5\frac{2}{3}\right)$$

S_2 $a = 4$ $b = 1$

$$\frac{ax_2 + bx_1}{a+b}, \quad \frac{ay_2 + by_1}{a+b}$$

$$\frac{(4)(-3)+(1)(18)}{5}, \quad \frac{(4)(-7)+(1)(12)}{5}$$

$$\frac{-12+18}{5} \quad \frac{-28+12}{5}$$

$$\left(\frac{6}{5}, -\frac{16}{5}\right)$$

d $S_1 - S_2$

$$d = \sqrt{\left(-3\frac{1}{5} - 5\frac{2}{3}\right)^2 + \left(\frac{6}{5} - 11\right)^2}$$

$$= \sqrt{78.62 + 96.04}$$

$$= \sqrt{174.66}$$

$$= 13.22\, u \times 50\,Km$$

$$= \boxed{660.8\ Km}$$

7. A cycling club decides to cycle from Montreal to Quebec City. Their trip is expected to take a few days.

On the first day, they reach a point (Point B) that divides the total distance in a ratio of $\dfrac{3}{7}$.

On the second day, they cover one-third of the remaining distance (to reach Point C).

One unit corresponds to 8 Km. Determine the distance they have left to cover to reach Quebec City (Point C – Quebec City) by identifying the coordinates of points B and C.

Clearly show all your work.

$$d = \sqrt{(7+2.33)^2 + (11+2.53)^2}$$

$$= \sqrt{87.0489 + 183.0609}$$

$$= 16.4350 \times 8\,Km = \boxed{131.5\,Km}$$ answer

Quebec City (11,7) $x_2 y_2$

$C(-2.53, -2.33)$

$B(-9.3, -7)$ $x_1 y_1$

Montreal (−18,−13) $x_1 y_1$

$a = 3$
$b = 7$

$C: \quad a = 1 \quad b = 2$

$B: \quad \dfrac{ax_2 + bx_1}{a+b} , \quad \dfrac{ay_2 + by_1}{a+b}$

$$\dfrac{(3)(11)+(7)(-18)}{10} , \quad \dfrac{(3)(7)+(7)(-13)}{10}$$

$$\dfrac{33-126}{10} , \quad \dfrac{21-91}{10}$$

$$\left(\dfrac{-93}{10} , \dfrac{-70}{10} \right)$$

$$(-9.3, -7)$$

$$\dfrac{ax_2 + bx_1}{a+b} , \quad \dfrac{ay_2 + by_1}{a+b}$$

$$\dfrac{(1)(11)+(2)(-9.3)}{3} , \quad \dfrac{(1)(7)+(2)(-7)}{3}$$

$$\dfrac{11-18.6}{3} , \quad \dfrac{7-14}{3}$$

$$(-2.53, -2.33)$$

NAME: _Shannon_

DATE: _____

Quiz

8. Margaret and Kevin are climbing to the top of Mont Tremblant. They are taking two different routes to see who gets to the top first. The diagram below shows the path each of them will take, as well as the coordinates of their starting points and of the summit.

Kevin

$a=1 \quad b=1$

$$\frac{a x_2 + b x_1}{2} \quad , \quad \frac{a y_2 + b y_1}{2}$$

$$\frac{5+(-3)}{2} \quad , \quad \frac{12+0}{2}$$

$$\frac{2}{2} \quad , \quad \frac{12}{2}$$

$$\left(1, 6\right)$$

$(1,6)X$

Kevin's start
$(-3,0)$
$x_1 y_1$

Top (5,12) $\quad x_2 \ y_2$

$b=2$

$Y\left(7, 6\tfrac{2}{3}\right)$

$a=1$

Margaret's start
(8,4)
$x_1 y_1$

$$\frac{a x_2 + b x_1}{a+b} \quad , \quad \frac{a y_2 + b y_1}{a+b}$$

$$\frac{(1)(5)+(2)(8)}{3} \quad , \quad \frac{(1)(12)+(2)(4)}{3}$$

$$\frac{5+16}{3} \quad , \quad \frac{12+8}{3}$$

$$\frac{21}{3} \quad , \quad \frac{20}{3}$$

$$\left(7, 6\tfrac{2}{3}\right)$$

After a morning of hiking, Kevin has covered half the distance to the summit. He then sits down to eat his lunch. Margaret, having injured her ankle, hasn't made as much progress. She notes that after she eats her lunch, she will have to hike twice the distance already covered in order to reach the summit before the end of the day.

One unit corresponds to 200 m. Determine the distance between Margaret and Kevin as they eat their lunches by identifying the coordinates of points X and Y.

Clearly show all your work.

$$d = \sqrt{\left(6\tfrac{2}{3}-6\right)^2 + \left(7-1\right)^2}$$

$$= \sqrt{0.44 + 36}$$

$$= 6.04 \ U \times 200m = \boxed{1207.31 \ m}$$

NAME: Shannen
DATE:

Quiz # 5

1.

In triangle *ABC*, angle *B* is a right angle. The coordinates of *A* are (-16,0) and those of *B* are (0,12). Determine the length of the base *AC* given that point *C* is located on the x-axis.

Clearly show all your work. Show all the steps in the solution. (10 Marks)

$B(0,12)$

$(-16,0)\ A$

C
$(?,)$
$(9,0)$
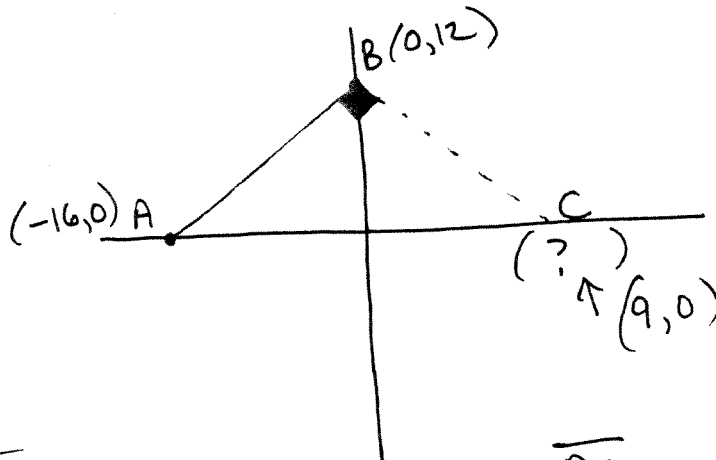
$\overline{AB}$

$m = \dfrac{y_2 - y_1}{x_2 - x_1}$

$= \dfrac{12 - 0}{0 + 16} = \dfrac{12}{16} = \dfrac{3}{4}$

$\overline{BC}$

$m = \dfrac{-4}{3}$

Eqn: $y = -\dfrac{4}{3}x + 12$

Let $x = 0$

$0 = -\dfrac{4}{3}x + 12$

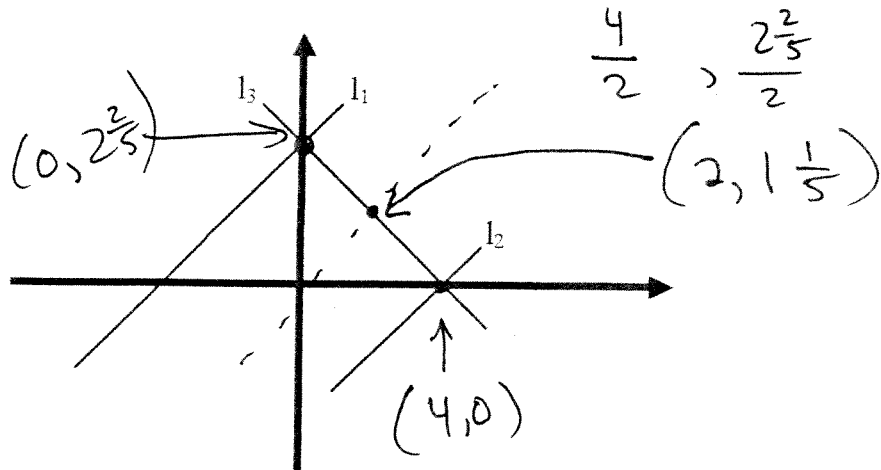$\left(\dfrac{3}{4}\right)\dfrac{4}{3}x = 12\left(\dfrac{3}{4}\right)$

$x = 9$

$\overline{AC} = 16 + 9$

$= \boxed{25\ units}$

2. Lines l_1 and l_2 are perpendicular to line l_3 whose equation is $3x + 5y - 12 = 0$. They intersect l_3 at its intercepts.

Determine the equation of the line that is equidistant from the two parallel lines.

Clearly show all your work. (10 marks)

$a = 1$
$b = 1$

$M: \dfrac{ax_2 + bx_1}{a+b}, \dfrac{ay_2 + by_1}{a+b}$

$\dfrac{4}{2}, \dfrac{2\frac{2}{5}}{2}$

$(2, 1\frac{1}{5})$

$(0, 2\frac{2}{5})$

l_3 l_1

l_2

$(4, 0)$

$\underline{l_3}$

$3x + 5y - 12 = 0$

$\dfrac{5y}{5} = \dfrac{-3x}{5} + \dfrac{12}{5}$

$y = \left(\dfrac{-3}{5}\right) x + \left(\dfrac{12}{5}\right)$

$\underset{m}{\Vert} \qquad b = 2\frac{2}{5}$

let $y = 0$

$3x + 5(0) - 12 = 0$

$3x - 12 = 0$

$\dfrac{3x}{3} = \dfrac{12}{3}$

$x = 4$

Unknown line

$m = \dfrac{5}{3}$

$(2, 1\frac{1}{5})$

$y = mx + b$

$1\frac{1}{5} = \left(\dfrac{5}{3}\right)(2) + b$

$1\frac{1}{5} = \dfrac{10}{3} + b$

$1\frac{1}{5} - \dfrac{10}{3} = b$

$-2\frac{2}{15} = b$

$y = \dfrac{5}{3}x - 2\frac{2}{15}$