Grade 10 Introduction to Applied and Pre-Calculus Mathematics (20S)

Final Practice Exam
Answer Key

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Final Practice Exam
Answer Key

Name: ______________________

Student Number: ______________________

Attending ❑ Non-Attending ❑

Phone Number: ______________________

Address: ______________________

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For Marker's Use Only

Date: ______________________

Final Mark ______ /100 = ______ %

Comments:

Instructions

The final examination will be weighted as follows:

Modules 1–8	100%

The format of the examination will be as follows:

Part A: Multiple Choice	30 marks
Part B: Definitions	10 marks
Part C: Graphs and Relations	5 marks
Part D: Measurement	5 marks
Part E: Trigonometry	3 marks
Part F: Relations and Functions	9 marks
Part G: Polynomials	14 marks
Part H: Coordinate Geometry	20 marks
Part I: Systems	4 marks

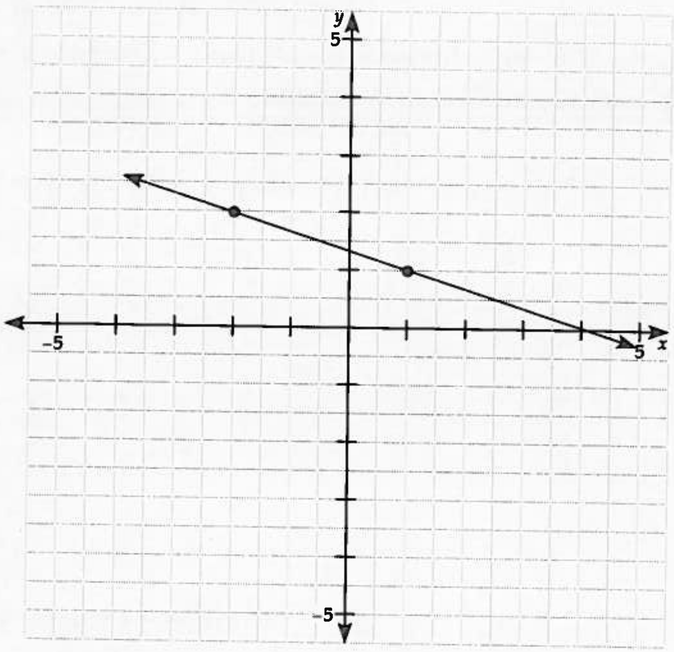
Time allowed: 2.5 hours

Note: You are allowed to bring a scientific calculator and your Resource Sheet to the exam. Your Resource Sheet must be handed in with the exam.

Part A: Multiple Choice (*30 x 1 = 30 marks*)

Circle the letter of the correct answer for each question.

1. Calculate the $\frac{\text{rise}}{\text{run}}$ of this line.



a) $\frac{1}{3}$

b) $\frac{3}{1}$

c) $\frac{-1}{3}$

d) $\frac{-3}{1}$

(Module 1, Lesson 3)

The line falls to the right, so the slope must be negative. The vertical change is 1 and the horizontal change is 3, so the correct answer is (c).

2. The x- and y-intercepts of the linear relation $3x + 5y - 15 = 0$ are at

a) (3, 0), (0, 5)

b) (5, 0), (0, 3)

c) (-3, 0), (0, -5)

d) (0, 0), 0, 0) (Module 7, Lesson 2)

Substitute $x = 0$ into the equation and solve for the y-intercept, and then substitute $y = 0$ and solve for the x-intercept. Watch for positive and negative signs.

3. The graph of a linear relation has a slope of 2 and goes through the point (3, –5). Another point on the line is at

a) (3, –8)

b) (-11, 0)

c) (5, –3)

d) (4, –3)

$y + 5 = 2(x - 3)$

$y + 5 = 2x - 6$

$y = 2x - 6 - 5$

$y = 2x - 11$ (Module 1, Lesson 4)

Substitute the given coordinates into the equation and see which makes a true statement.

Or, consider that the vertical change is +2 and the horizontal change is +1.

(3 + 1, –5 + 2) gives you (4, –3).

Or, make a sketch of the point and count up 2 and 1 space to the right and mark the next point; alternately, move down 2 and 1 space to the left to find points to the left of the given point.

4. The slope of a horizontal line is

a) 0

b) 1

c) –1

d) undefined (Module 1, Lesson 4)

A horizontal line has a rise of 0 and an infinite run, so the slope is 0. A slope of 1 rises to the right, and a slope of –1 falls to the right. A vertical line has an undefined slope because the rise is infinite and the run is zero. If the denominator is 0, it is undefined because you cannot divide by zero.

5. The equation of a line that is parallel to $y = 3x + 5$ is

a) $y = -3x + 15$

b) $y = \frac{-1}{3}x + 5$

c) $y = -3x + 5$

d) $y = 3x + 15$

(Module 1, Lesson 4)

Parallel lines have the same slope.

6. Write $\sqrt[5]{x}$ with a rational exponent.

a) $x^{\frac{5}{1}}$

b) x^{-5}

c) $x^{\frac{1}{5}}$

d) $5^{\frac{1}{x}}$

(Module 2, Lesson 5)

The fifth root of x would be the value that could be multiplied by itself 5 times and result in x. Using the power of a power law, $\left(x^{\frac{1}{5}}\right)^5 = x^{\frac{5}{5}} = x$.

7. Write $\sqrt{12}$ as a mixed radical.

a) $4\sqrt{3}$

b) $2\sqrt{3}$

c) $3\sqrt{2}$

d) $3\sqrt{4}$

(Module 2, Lesson 3)

12 has the perfect square factor of 4 ($4 * 3 = 12$). The square root of 4 is 2, so when moving the 4 out from under the square root sign you are left with $2 * \sqrt{3}$.

8. Simplify $(3m^4n)(2m^5n)$.

a) $5m^9n$

b) $6m^9n$

c) $6m^{20}n^2$

d) $6m^9n^2$ (Module 2, Lesson 4)

The product law states that exponents must be added when multiplying like bases. An exponent of 1 is assumed for each variable if no exponent is stated. You must also multiply the coefficients.

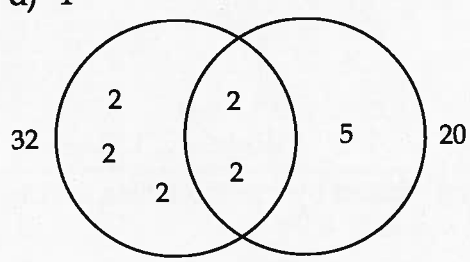
9. The least common multiple of 32 and 20 is

a) 160

b) 640

c) 320

d) 4 (Module 2, Lesson 1)



10. Which of the following is a perfect cube number?

a) 324

b) 343

c) 333

d) 361 (Module 2, Lesson 2)

324, 343, and 361 are all perfect square numbers. 333 is divisible by 3 but only 343 has a cube root ($7^3 = 343$).

11. Convert 147 m to inches.

a) 186.37″
b) 3.73″
c) 14700″
d) 5787″ (Module 3, Lesson 3)

There are 39.37 inches in a metre, so multiply 147 ∗ 39.37 = 5787. (a) has the conversion amount added, (b) divided 147 by the conversion factor, (c) used the conversion factor for m to cm.

12. A pool is 6 m long and 4 m wide. If it is filled to a depth of 80 cm, how many cubic metres of water are required?

a) 1920 m^3
b) 19.2 m^3
c) 7077.888 m^3
d) 192 m^3 (Module 3, Lesson 1)

(6 ∗ 4 ∗ 0.8 = 19.2) If you chose (a). you didn't convert cm to m. If you chose (c), the final answer was incorrectly cubed. If you chose (d), 80 cm was converted to 8 m instead of 0.8.

13. The volume of a sphere is 87 cm^3. Calculate the radius of the sphere.

a) 20.8 cm
b) 2.7 cm
c) 4.6 cm
d) 5.9 cm (Module 3, Lesson 6)

($r^3 = 20.8$) (c) Found the square root rather than the cube root. (d) Did not use brackets when dividing by a product.

14. The volume of a cone is 30 m^3. What is the volume of a cylinder with the same base and height?

a) 10 m^3
b) 30 m^3
c) 90 m^3
d) 900 m^3 (Module 3, Lesson 6)

The volume of a cone is one-third the volume of a cylinder with the same base and height, or the volume of a cylinder is three times the volume of a cone with the same base and height. (a) is one-third the volume of the cone, not 3 times the volume. (b) is the same volume. (d) is the volume cubed.

15. The width of a child's pinky finger could be used as a referent for

a) 1 mm

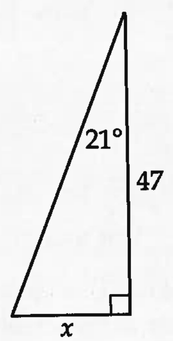
b) 1 m

c) 1 inch

d) 1 cm (Module 3, Lesson 1)

1 mm is about the width of a credit card or dime, 1 m is the approximate width of a door or a twin bed, 1 inch is the height of a hockey puck or the diameter of a loonie.

16. Solve for x.



a) 122.4

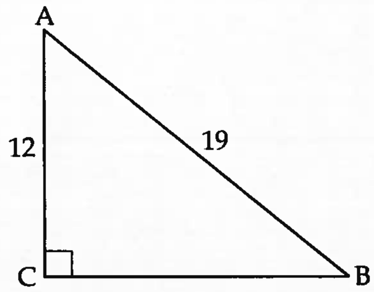
b) 18.0

c) 19.1

d) 43.9 (Module 4, Lesson 1)

In terms of the given angle, you know the adjacent side and want to find the opposite side length. The correct trig ratio is $\tan\theta = \dfrac{\text{opposite}}{\text{adjacent}}$. (a) You exchanged the opposite and adjacent sides (c) You omitted the bracket and found tan(21) * 47 instead of 47 * tan(21). (d) used the cosine ratio.

17. Solve for the measure of ∠B.



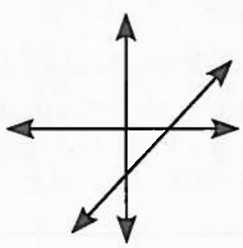
a) 32.3°
b) 39.2°
c) 50.8°
d) 57.7°

(Module 4, Lesson 3)

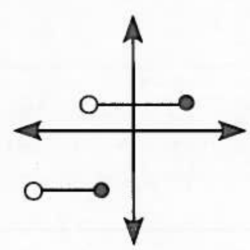
(a) used $\tan^{-1}\left(\frac{12}{19}\right)$. (c) used $\cos^{-1}\left(\frac{12}{19}\right)$. (d) used $\tan^{-1}\left(\frac{19}{12}\right)$.

18. Which of the following does not represent a function?

a)

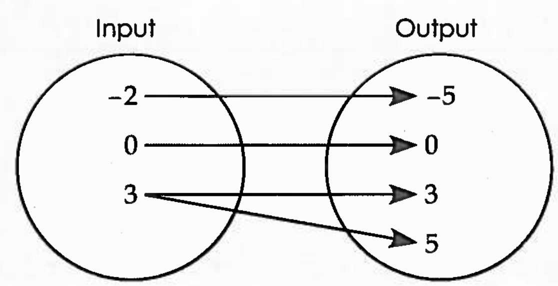


b)



c) {(2, 2), (3, 2), (4, 2) (5, 2)}

d)



a) A
b) B
c) C
d) D

(A) passes the vertical line test. (B) the hollow dots indicate that the graph goes up to that point but does not include it, the solid dot indicates the point is included, so the graph passes the vertical line test. (C) Each input has one possible output. The points would lie in a horizontal line. (D) The input of 3 has two possible outputs, so this one is not a function.

(Module 5, Lesson 1)

19. Given the function $f(x)=\frac{3}{2}x+9$, find $f(4)$.

a) $\frac{-10}{3}$

b) 10.5

c) 15.0

d) 19.5

(Module 5, Lesson 3)

(a) substituted the 4 for $f(x)$ rather than for x. (b) incorrect order of operations—multiply 4 and 3 and divide by 2 before you add 9. (d) incorrect order of operations—added the 4 and 9 and then multiplied by $\frac{3}{2}$.

20. Multiply $4(2x + 3)$.

a) $8x + 12$

b) $8x + 3$

c) $2x + 12$

d) $24x$

(Module 6, Lesson 1)

(b) didn't apply distributive property and only multiplied 4 by the first term in the bracket. (c) didn't apply distributive property and only multiplied 4 by the second term in the bracket. (d) incorrectly multiplied the terms inside the bracket and found the product of $4(6x)$.

21. Multiply $(x + 4)(x + 9)$.

a) $x^2 + 13$

b) $2x + 13 + 36$

c) $x^2 + 36$

d) $x^2 + 13x + 36$

(Module 6, Lesson 2)

(a) only multiplied the two first terms and added the two last terms. (b) added the two x terms, added the two last terms, and then multiplied the two last terms. (c) multiplied two first terms and two last terms. Missed multiplying the outside terms and the inside terms.

22. Factor $8k + 14$.

a) $8(k + 14)$

b) $2(4k + 7)$

c) $4k(2 * 7)$

d) $8(k + 6)$ (Module 6, Lesson 3)

(a) removed the coefficient of the first term but didn't divide the second term by it (8 is not a factor of 14). (c) k is not a common term and 4 is not a factor of 14. (d) $8 + 6 = 14$ but 8 is not a factor of 14.

23. Factor $x^2 - 4x - 12$.

a) $(x - 6)(x + 2)$

b) $(x + 6)(x - 2)$

c) $(x - 6)(x - 2)$

d) $(x + 6)(x + 2)$ (Module 6, Lesson 3)

(b) incorrect signs would give you $+4x$ for the middle term of the trinomial. (c) incorrect signs would give you $x^2 - 8x + 12$. (d) incorrect signs would give you $x^2 + 8x + 12$.

24. Factor $x^2 - 25$.

a) $(x - 5)(x - 5)$

b) $(x + 5)(x + 5)$

c) $(x - 5)^2$

d) $(x + 5)(x - 5)$ (Module 6, Lesson 5)

(a), (b), and (c) are all perfect square factors, not the difference of squares factors.

25. Calculate the distance between the coordinate points (13, 5) and (–17, –9).

a) 33.1

b) 5.7

c) 26.5

d) 11.3 (Module 7, Lesson 1)

a) $\sqrt{(-17-13)^2+(-9-5)^2}=33.1$

b) $\sqrt{(-17+13)^2+(-9+5)^2}=5.7$ incorrect sign inside brackets

c) $\sqrt{(-17-13)^2-(-9-5)^2}=26.5$ incorrect sign between brackets

d) $\sqrt{(13-5)^2+(-17+9)^2}=11.3$ incorrect substitution of ordered pairs

26. Calculate the coordinates of the midpoint of the line segment with endpoints at (–15, 9) and (7, –11).

a) (–11, 10)
b) (11, –1)
c) (4, 1)
d) (–4, –1)

(Module 7, Lesson 1)

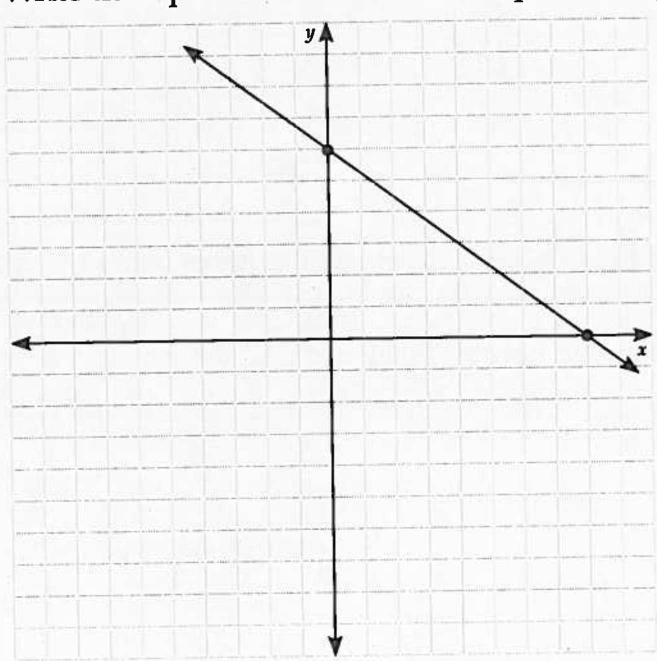
a) $\left(\frac{-15-7}{2}, \frac{9+11}{2}\right) \to (-11, 10)$ Subtracting coordinates instead of adding them

b) $\left(\frac{15+7}{2}, \frac{9-11}{2}\right) \to (11, -1)$ Incorrect signs

c) $\left(\frac{15-7}{2}, \frac{11-9}{2}\right) \to (4, 1)$ Incorrect signs

d) $\left(\frac{-15+7}{2}, \frac{9-11}{2}\right) \to (-4, -1)$

27. Write the equation of this line in slope-intercept form.



a) $y = \frac{3}{4}x + 6$

b) $y = \frac{4}{3}x + 8$

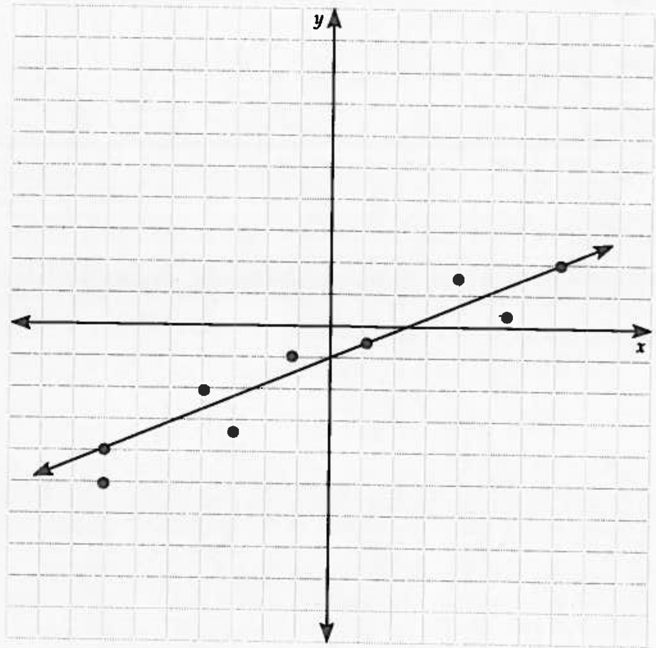
c) $y = \frac{-3}{4}x + 6$

d) $y = \frac{-3}{4}x + 8$

(Module 7, Lesson 2)

(a) slope should have a negative rise. (b) mixed up rise and run, used the x-intercept.
(d) used x-intercept.

28. The correlation of this data is best described as



a) strong negative
b) weak negative
c) weak positive
d) strong positive

(Module 7, Lesson 4)

The line of best fit rises to the right or has a positive slope, so the correlation is positive. The points are close to the line of best fit so the correlation is strong.

29. Three of the following linear relations are equivalent. Circle the one relation that is not equivalent to the others.

a) $2x - y + 5 = 0$
b) $y - 11 = 2(x - 3)$
c) $y = 5x + 2$
d) $3y - 6x = 15$

(Module 7, Lesson 2)

You can rewrite them all in $y = mx + b$ form and see which one is different. You may also notice that the coefficient of x simplifies to 2 in all cases except (c), so that line has a different slope.

30. Which ordered pair is the solution to the given system of linear equations?

$x - 5y = -15$ Equation 1

$4x + 10y = -30$ Equation 2

a) (–5, –1)
b) (–5, 2)
c) (5, –5)
d) (–10, 1)

(Module 8, Lesson 1)

Substitute the ordered pair into both equations and see which pair makes both equations true.

(a) Only makes Equation 2 true.

(b) Only makes Equation 1 true.

(c) Only makes Equation 2 true.

Part B: Definitions (*10 x 1 = 10 marks*)

Match each definition with the correct term or symbol from the list below. Write the correct term or symbol on the blank line with each definition. Terms are used only once. Not all terms have a definition provided.

Terms

° > < ( )	domain	negative correlation	simplify
· ≥ ≤ [ ]	equation	ordered pair	slope-intercept form
∅	function	parallel lines	slope-point form
binomial	general form	perpendicular lines	solution
Cartesian plane	inconsistent system	polynomial	strong correlation
coefficient	independent system	positive correlation	system of linear equations
consistent system	like terms	range	table of values
constant	linear relation	relation	trinomial
correlation coefficient	mapping	rule	weak correlation
degree	monomial	scatterplot	zero correlation
dependent system			

1. A graphic similar to a table of values that has arrows showing which input results in a given output. ***mapping***
2. If, as the x-variable increases in value, the y-variable also increases the data displays a ***positive correlation***.
3. The equations in this linear system represent the same line. ***dependent system***
4. The coordinate system formed by a horizontal axis and a vertical axis in which a pair of numbers represents each point in the plane. ***Cartesian plane***
5. A mathematical expression with one or more terms. ***polynomial***
6. $r = 0$ ***zero correlation***
7. The highest exponent in the leading term of the polynomial, when terms are written in descending order. ***degree***
8. A set of two numbers named in a specific order so that the first number represents the domain value and the second number represents the range value. ***ordered pair***
9. Any set of ordered pairs. ***relation***
10. Goes to and includes. ≥ ≤ [ ]

Part C: Graphs and Relations (*5 marks*)

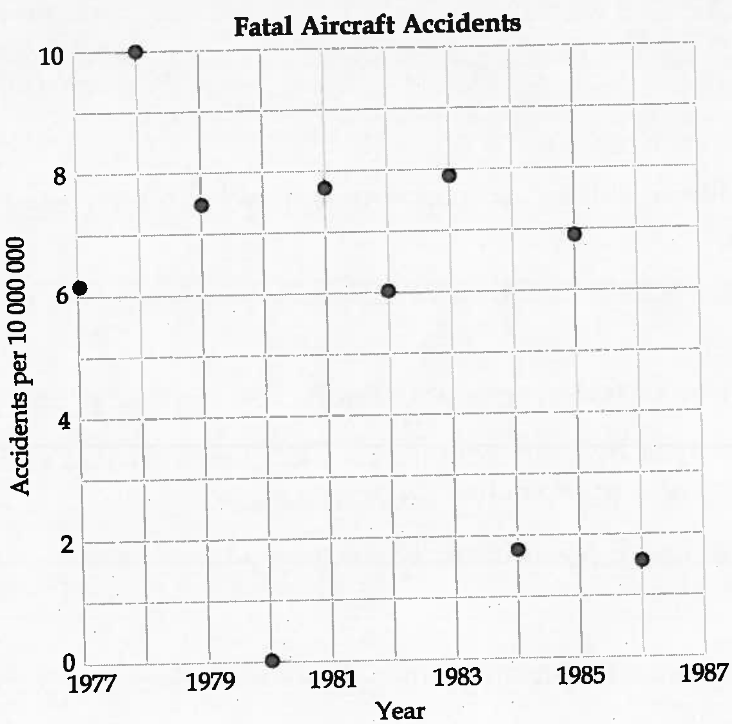
Show all calculations and formulas used for short and long answer questions. Use all decimal places in your calculations, and round the final answers to the correct number of decimal places. Include units when appropriate. Clearly state your final answer.

1. The following table shows the number of fatal accidents per 10 000 000 aircraft departures for U. S. airlines for the 10 years from 1977 to 1986.

Year	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986
Fatal Accicents per 10 000 000	6.1	10.0	7.4	0.0	7.7	6.0	7.9	1.8	6.9	1.6

a) Create a scatterplot of this data. Include labels, units and a title. *(3 marks)*

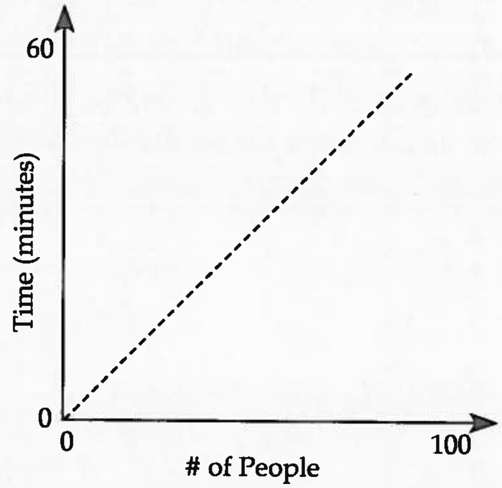
Answer:



(Module 1, Lesson 3)

2. a) Sketch and label a graph that could represent the length of time spent waiting in line to get into the hockey arena and the number of people in line ahead of you. *(1 mark)*

Answer:



b) State a reasonable domain and range for this situation. Explain. *(1 mark)*

Answer:

Answers may vary.

The number of people ahead of you could be any positive integer because you can't have a negative number of people, but realistically, because there are multiple doors, a maximum of 100 people in a line ahead of you seems reasonable. The domain could be from zero to 100 people.

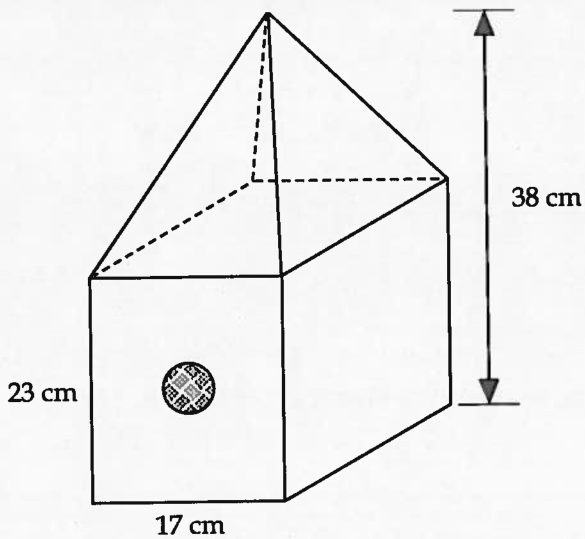
The range will also be positive values because you can't have negative time. I don't think you would have to wait longer than an hour to get into the arena so the range could be from zero to 60 minutes.

(Module 1, Lesson 2)

Part D: Measurement (*5 marks*)

Show all calculations and formulas used for short and long answer questions. Use all decimal places in your calculations, and round the final answers to the correct number of decimal places. Include units when appropriate. Clearly state your final answer.

1. A birdhouse with a square base has a peaked roof as illustrated below. The total height of the birdhouse is 38 cm. Calculate the amount of space inside the birdhouse to the nearest cm³. *(5 marks)*



Answer:

The space inside the birdhouse is the volume of the composite object.

$V = Bh_1 + \frac{1}{3}Bh_2$

$B = 17^2$

$h_1 = 23$

$h_2 = 38 - 23 = 15$

$V = Bh_1 + \frac{1}{3}Bh_2$

$V = (17^2)(23) + \frac{1}{3}(17^2)(15)$

$V = 6647 + 1445$

$V = 8092$

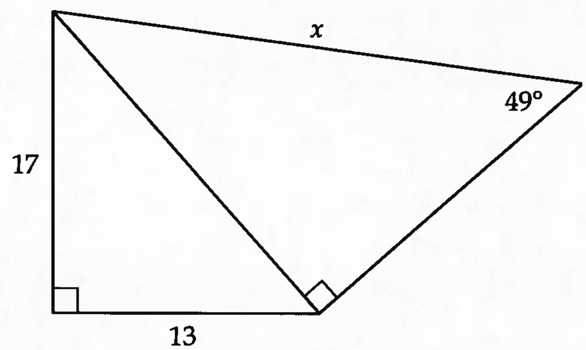
The volume of the birdhouse is 8092 cm².

(Module 3, Lesson 5)

Part E: Trigonometry (*3 marks*)

Show all calculations and formulas used for short and long answer questions. Use all decimal places in your calculations, and round the final answers to the correct number of decimal places. Include units when appropriate. Clearly state your final answer.

1. Solve for the length of side x. *(3 marks)*



Answer:

$$a^2 + b^2 = c^2$$

$$17^2 + 13^2 = c^2$$

$$c^2 = 21.40093456$$

$$\sin\theta = \frac{\text{opposite}}{\text{hypotenuse}}$$

$$\sin 49^\circ = \frac{21.40093456}{x}$$

$$x = 28.36$$

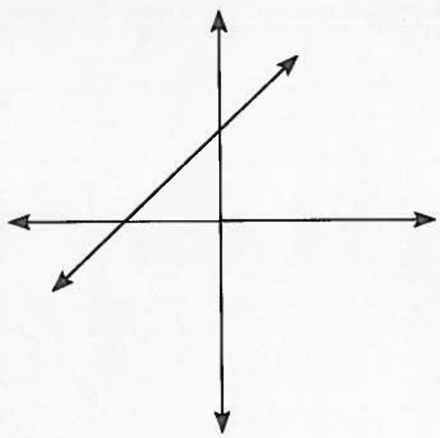
(Module 4, Lesson 4)

Part F: Relations and Functions (*9 marks*)

Show all calculations and formulas used for short and long answer questions. Use all decimal places in your calculations, and round the final answers to the correct number of decimal places. Include units when appropriate. Clearly state your final answer.

1. State the domain and range of the following relations in both set and interval notation. *(4 marks)*

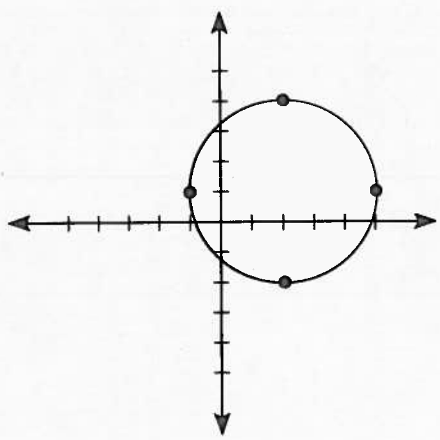
a)



Answer:

D: $\{x \in \Re\}$
R: $\{y \in \Re\}$
D: $(-\infty, \infty)$
R: $(-\infty, \infty)$

b)



Answer:

D: $\{-1 \leq x \leq 5, x \in \Re\}$
R: $\{-2 \leq y \leq 4, y \in \Re\}$
D: $[-1, 5]$
R: $[-2, 4]$

(Module 5, Lesson 2)

2. Given the linear equation $2x - 3y - 15 = 0$

a) Express the linear equation in functional notation. *(2 marks)*

Answer:

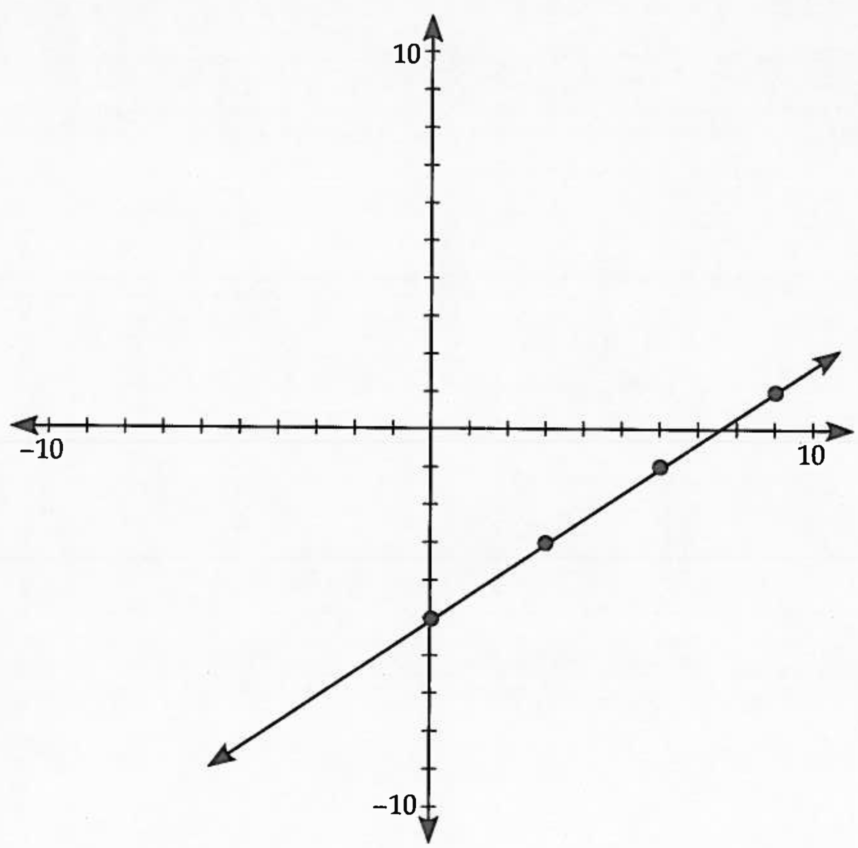
$$2x - 15 = 3y$$

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

$$f(x) = \frac{2}{3}x - 5$$

b) Sketch the linear function. *(1 mark)*

Answer:



(Module 5, Lesson 3)

3. Explain how you can determine whether or not a given set of ordered pairs represents a function. *(2 marks)*

   Answer:

   Look at the domain, or x-values, in the ordered pairs. If an x-value is duplicated and has two or more possible outputs, then the ordered pairs represent a relation but not a function. If each input or x-value has only one possible y-value or output, the ordered pairs represent a function.

(Module 5, Lesson 1)

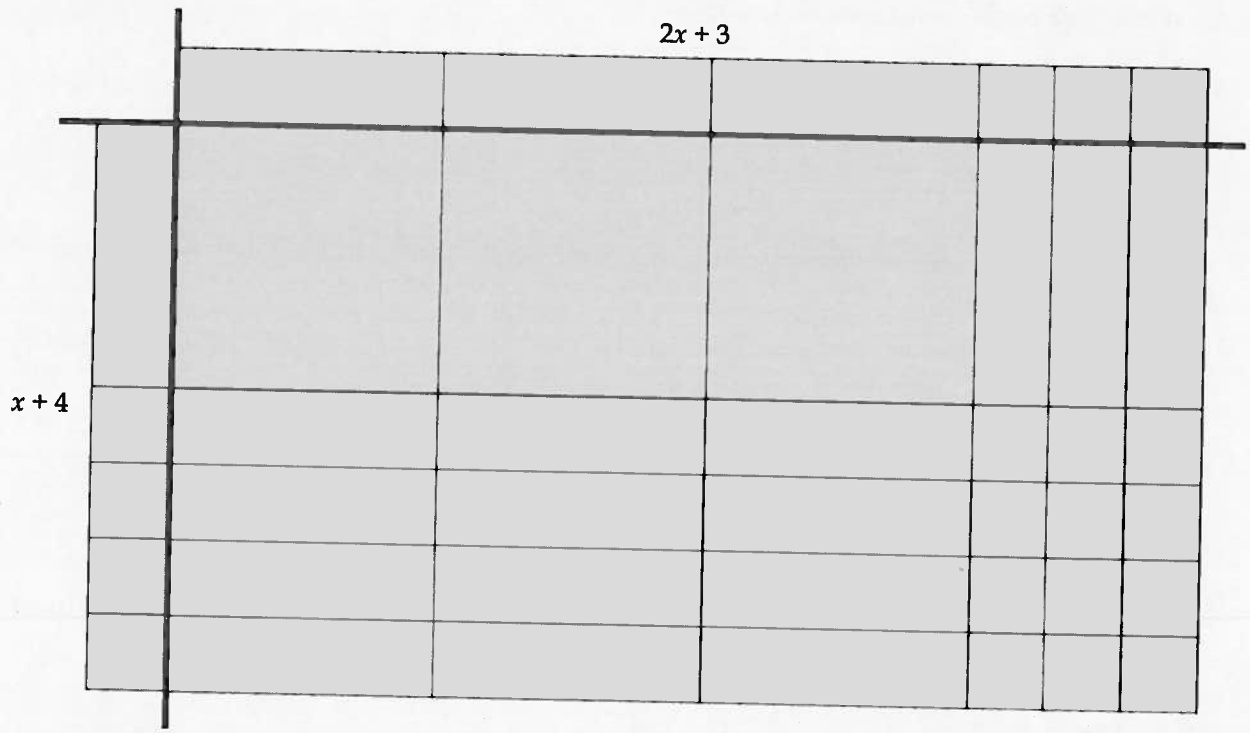
Part G: Polynomials (*14 marks*)

Show all calculations and formulas used for short and long answer questions. Use all decimal places in your calculations, and round the final answers to the correct number of decimal places. Include units when appropriate. Clearly state your final answer.

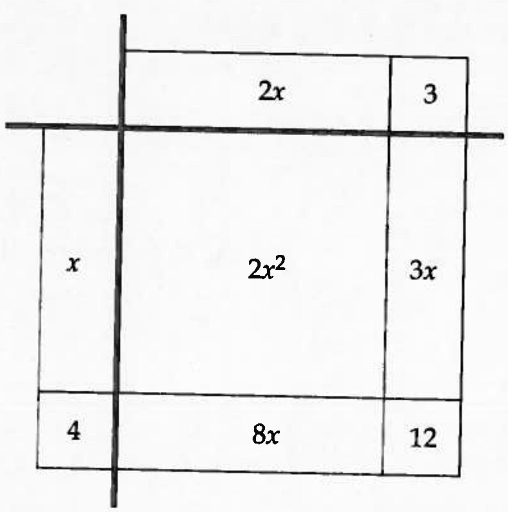
1. Represent the product of $(2x + 3)(x + 4)$ pictorially. State the simplified solution. *(4 marks)*

   Answer:

   Students may use the area model or tiles. No marks deducted if tiles not shaded.



or



$$(2x + 3)(x + 4)$$
$$= 2x^2 + 3x + 8x + 12$$
$$= 2x^2 + 11x + 12$$

(Module 6, Lesson 2)

2. Multiply and simplify the solution.

a) $(x - 3)(3x + 5)$ *(3 marks)*

Answer:

$(x - 2)(3x + 5)$
$= 3x^2 + 5x - 9x - 15$
$= 3x^2 - 4x - 15$

b) $(5x + 4)(2x - 3)$ *(3 marks)*

Answer:

$(5x + 4)(2x - 3)$
$= 10x^2 - 15x + 8x - 12$
$= 10x^2 - 7x - 12$

Students may use arrow showing the distributive property, FOIL, tiles, or the area model to show their work.

(Module 6, Lesson 2)

3. Factor completely. Verify by multiplying the factors. *(4 marks)*

$$2x^2 + 7x + 6$$

Answer:

$2 * 6 = 12$ Factor pairs of 12 are (1, 12), (2, 6), and (3, 4). The pair (3, 4) gives a sum of 7

$2x^2 + 7x + 6$
$= 2x^2 + 3x + 4x + 6$
$= x(2x + 3) + 2(2x + 3)$
$= (x + 2)(2x + 3)$

Verify:

$(x + 2)(2x + 3)$
$= 2x^2 + 3x + 4x + 6$
$= 2x^2 + 7x + 6$

(Module 6, Lesson 3)

Part H: Coordinate Geometry (*20 marks*)

Show all calculations and formulas used for short and long answer questions. Use all decimal places in your calculations, and round the final answers to the correct number of decimal places. Include units when appropriate. Clearly state your final answer.

1. The centre of a circle is at (52, 34). If an endpoint of its diameter is at (61, 46), find the coordinates of the other endpoint. *(3 marks)*

   Answer:

   $$52 = \frac{61 + x_2}{2} \qquad 34 = \frac{46 + y_2}{2}$$

   $$104 - 61 = x_2 \qquad 68 - 46 = y_2$$

   $$x_2 = 43 \qquad y_2 = 22$$

   The other endpoint is at (43, 22).

   (Module 7, Lesson 1)

2. Express the linear equation $y - 5 = \frac{2}{7}(x - 21)$ in slope-intercept form. *(2 marks)*

   Answer:

   $$y - 5 = \frac{2}{7}(x - 21)$$

   $$y - 5 = \frac{2}{7}x - 6$$

   $$y = \frac{2}{7}x - 6 + 5$$

   $$y = \frac{2}{7}x - 1$$

   (Module 7, Lesson 2)

3. Explain a strategy for graphing a linear equation given in point-slope form. *(3 marks)*

Answer:

Answers may vary.

Point-slope form is $y - y_1 = m(x - x_1)$ where m is the slope or $\frac{\text{rise}}{\text{run}}$ and (x_1, y_1) is a point on the graph of the line. Locate the point (x_1, y_1). From that point, count up or down the number of units in the numerator of the slope or m, and to the right the number of units in the denominator (move 1 to the right if m is a whole number). Mark a point there, repeat the $\frac{\text{rise}}{\text{run}}$ to find the next point, and then connect the points with a straight line.

Note: To go from one point to the next using slope = $\frac{\text{rise}}{\text{run}}$, you have choices:

- if slope is positive, you can $\frac{\text{rise up}}{\text{run right}}$ or $\frac{\text{rise down}}{\text{run left}}$.
- if slope is negative, you can $\frac{\text{rise up}}{\text{run left}}$ or $\frac{\text{rise down}}{\text{run right}}$.

(Module 7, Lesson 3)

4. The graph of a linear relation goes through the points (9, –11) and (13, –2). Write the equation of the linear relation in point-slope form. *(3 marks)*

Answer:

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

$$m = \frac{-2+11}{13-9}$$

$$m = \frac{9}{4}$$

$$y + 11 = \frac{9}{4}(x - 9)$$

(Module 7, Lesson 3)

5. The graph of a linear relation goes through the point (6, 4) and is parallel to the line $y = 5x + 10$. Write the equation of the linear relation in slope-intercept form. *(3 marks)*

   Answer:

   Steps may vary.

   $y - 4 = 5(x - 6)$

   $y = 5x - 26$

   (Module 7, Lesson 3)

6. Determine if the triangle with vertices at A(–5, 3), B(–1, –8), and C(6, –1) is an isosceles triangle. *(6 marks)*

   Answer:

   Use the distance formula to show two sides are the same length.

   $d_{AB} = \sqrt{(-8-3)^2 + (-1+5)^2}$

   $d_{AB} = \sqrt{121+16} = \sqrt{137}$

   $d_{BC} = \sqrt{(-1+8)^2 + (6+1)^2}$

   $d_{BC} = \sqrt{49+49} = \sqrt{98}$

   $d_{AC} = \sqrt{(-1-3)^2 + (6+5)^2}$

   $d_{AC} = \sqrt{16+121} = \sqrt{137}$

   $AC = AB = \sqrt{137}$

   Triangle ABC is an isosceles triangle because two side lengths are congruent.

   (Module 7, Lesson 1)

Part I: Systems (*4 marks*)

Show all calculations and formulas used for short and long answer questions. Use all decimal places in your calculations, and round the final answers to the correct number of decimal places. Include units when appropriate. Clearly state your final answer.

1. Suzy has a German Shepherd and a Toy Poodle. The difference in height between them is 15″. Twice the height of a poodle is still 6″ shorter than a German Shepherd. Write a system of linear equations to represent this situation. Do **not** solve the system. *(1 mark)*

   Answer:

   $G - P = 15$

   $2P = G - 6$

   (Module 8, Lesson 2)

2. Solve the system of linear equations using elimination by addition or subtraction. *(3 marks)*

   $3x + 2y = 4$

   $x - y = 3$

   Answer:

$$
\begin{array}{lcrl}
3x+2y=4 & & 3x+2y=4 & \\
3(x-y=3) & \rightarrow & \underline{3x-3y=9} & \\
 & & 5y=-5 & \text{Subtract} \\
 & & y=-1 &
\end{array}
$$

$x-y=3$

$x-(-1)=3$

$x+1=3$

$x=2$

$(2,-1)$

(Module 8, Lesson 2)

Verify:

$3x + 2y$	4
$3(2) + 2(-1)$	4
$6 - 2$	4
4	4

$x - y$	3
$2 - (-1)$	3
$2 + 1$	3
3	3