

**GRADE 12 ESSENTIAL
UNIT G – GEOMETRY AND TRIGONOMETRY
WORKBOOK**

Name: _____
Date: _____

**GEOMETRY AND TRIGONOMETRY
WORKBOOK**

**A Selection of Questions for Geometry and Trigonometry from
Archived Exams
[teacher will have additional questions also]**

Calculate Decimal and Percent Answers to the nearest 0.01as always

**A Selection of Questions for Geometry and Trigonometry from
Archived Exams**

Manitoba Education and Advanced Learning School Programs Division
Winnipeg, Manitoba, Canada

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DIRECTIONS FOR A TEST

(This is just a workbook though! Not hand-in)

- ◆ Show complete answers in the space(s) provided on a test. In this workbook there is likely not enough room! Use your own paper for this workbook.
- ◆ Let the mark values for each question guide you in answering the question.
- ◆ Show all your work on a test so you can get part marks and to organize your thoughts.
- ◆ Be sure to include units in your final answer.
- ◆ Use your Formula Sheet and your study sheet.
- ◆ Provide explanations and justifications.
- ◆ Use a well-organized method to communicate your answer. I.e: Label steps, label calculations, box answer(s), write answer in words,

The Meaning of Directing Words on Tests	
identify/choose	the appropriate answer(s) from a given list of choices
state	a word, sentence, or number, without an explanation
describe/explain	words or symbols, diagrams, charts or graphs, or other methods that clearly show what you are thinking
justify/support	an explanation, information, or evidence that shows why your method, idea, or answer is correct
sketch	a reasonably neat picture or diagram (not necessarily to scale) that shows or explains an idea, concept, or method
calculate/determine	a mathematical formula, an algebraic equation, or a numerical calculation to solve a problem

January 2013

20. The Sine Law is often used in construction, commercial, industrial, or artistic applications.

A) Demonstrate one use of the Sine Law in the real world by performing the following two steps: (2 marks)

- State a specific example where Sine Law is used.
- Support your example with a written explanation, or with other information or evidence, of how Sine Law is used.

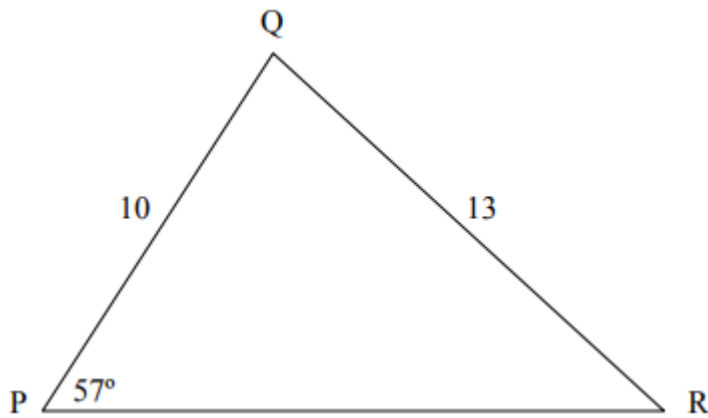
B) Sketch a reasonably neat picture or diagram (not necessarily to scale) that supports your example in Part A. (1 mark)

A) A good example is triangulating someone's phone!

21. In triangle ABC, the length of side AB is 14 cm and the length of side AC is 18 cm. The measure of angle A is 31° . Calculate the length of side BC in cm.

Ans: 9.38 (cm)

22. Given triangle PQR:



Determine the measure of angle R in degrees to the nearest whole degree.

Ans: 40°

23. The sum of the interior angles of a polygon is 900° . Determine the number of sides of the polygon.

Ans: $N = 7$

24. State two (2) properties that would prove a quadrilateral is a parallelogram.

Ans: Various

31. You are given the following set of marks from a recent quiz:

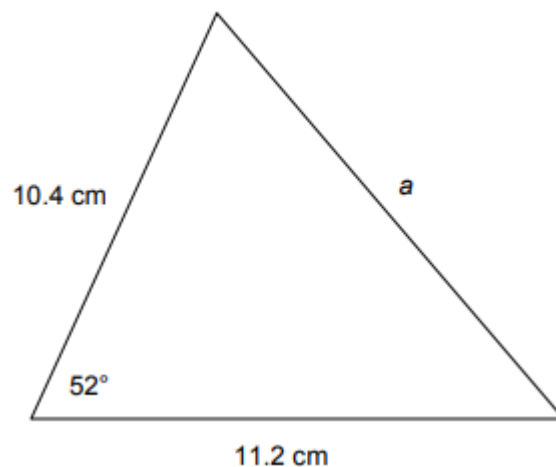
7	4.5	2.5	8.5	4	7	4.5	9.5	6.5
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Determine the Mean and the Median

Ans: 6 and 6.5

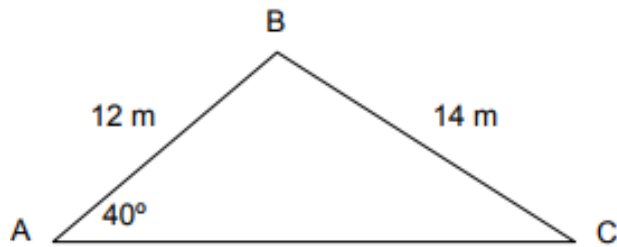
Jan 2014

20. Given the triangle below, calculate the length of side a in centimetres



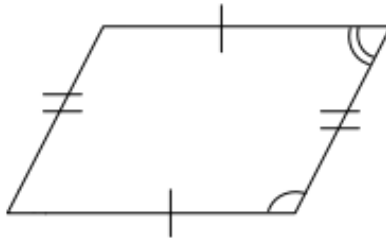
Ans: $a = 9.5$ (cm)

22. Given the triangle below, calculate the measure of angle C, in degrees to nearest tenth.



Ans: angle C = 33.4°

24. Choose the letter that best completes the statement below. Refer to the following diagram. It is true that:



- a) the diagonals are equal
- b) the consecutive angles are equal
- c) the diagonals are perpendicular
- d) the opposite angles are equal

Ans: D

25. Determine (by illustration or calculation) the total number of diagonals in a regular six-sided polygon.

Ans: There are 9 diagonals

26. Choose the letter that best completes the statement below. An isosceles triangle must have

- a) a right angle
- b) two sides of the same length
- c) all angles with different measures
- d) all acute angles

ANS: b)

27. A coin is in the shape of a regular polygon with 11 sides. State the measure of a central angle in degrees. To nearest 0.1 degrees



Ans: 32.7°

Jan 2016

14. Mark wants to buy a new truck worth \$25 500. The dealership offers him a trade-in value of \$3500 for his used car. Calculate the purchase price of the new truck after taxes (assume 8% PST and 5% GST).

Ans: \$24 860

17. On average, the fuel economy of Jasmine's vehicle is 8.5 L/100 km. In the past month, Jasmine has travelled a total of 2800 km.

A) Calculate the total litres of gas Jasmine's vehicle used for the month based on the average fuel economy. (2 marks)

B) State the total cost of fuel used if it costs \$1.23 per litre. (1 mark)

Ans: A) 238 L B) \$292.74

Don't forget, the price of fuel has lots of different taxes on it, not just PST and GST! So PST and GST are included in the price of gas.

21. A manufacturer of solar panels states that panels should be installed at a 70° angle with the horizontal base of the roof. Calculate the length of the roof as identified in the diagram.

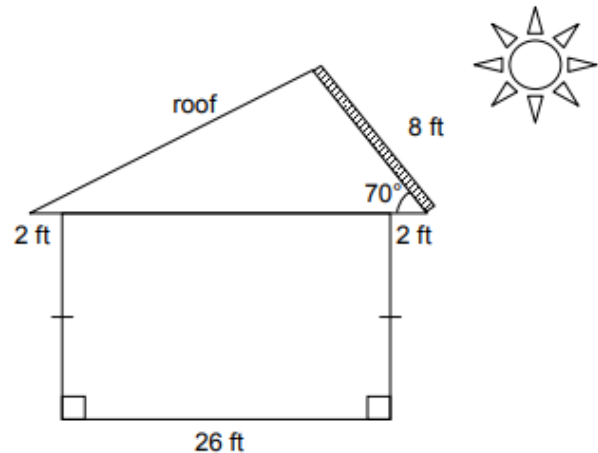
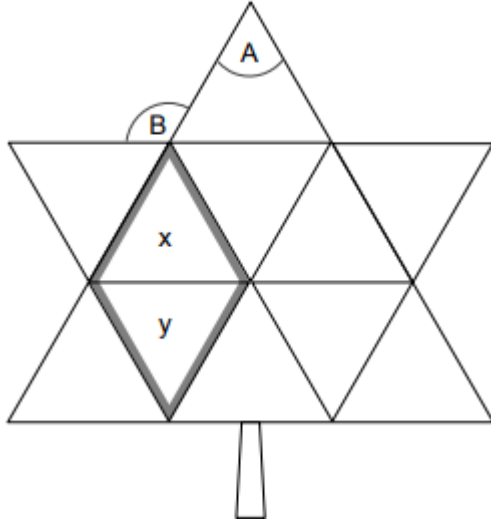


Diagram is not to scale

Ans: $x = 28.3$ ft

22. Canada's Centennial Maple Leaf is made up of 11 equilateral triangles.



- A) State the measure of angle A. (1 mark)
 B) State the measure of angle B. (1 mark)
 C) State the type of quadrilateral created by combining triangles x and y

Note the meaning of the directing word 'state'

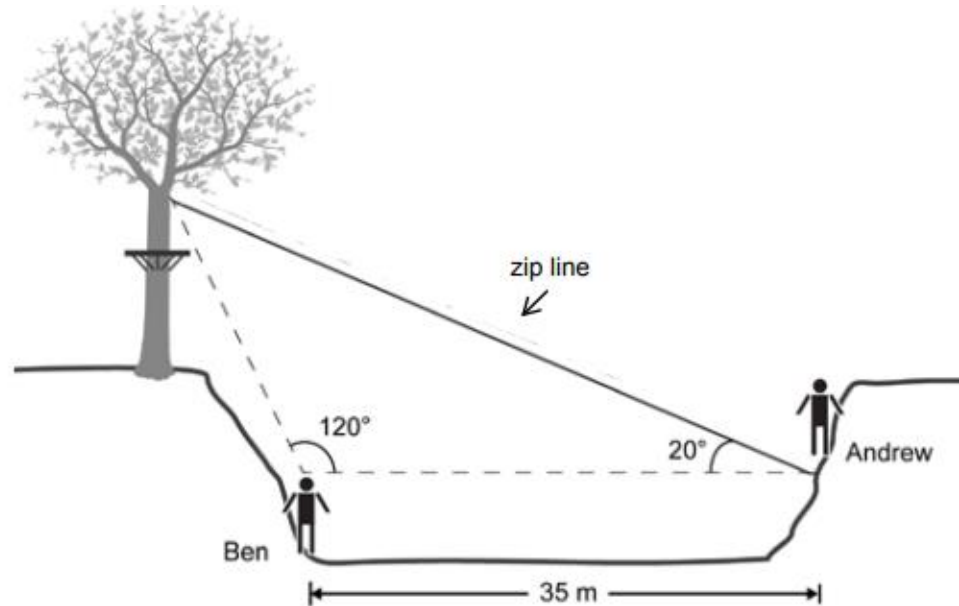
A) 60° , 120° , Rhombus or Parallelogram

23. Squares and parallelograms are geometric figures. Using properties of polygons:

- A) Explain why a square is a parallelogram. (1 mark)
 B) Explain why a parallelogram is not always a square. (1 mark)

Ans: Various

24. Andrew and Ben are building a zip line across a ravine.



Calculate the length of the zip line.

Ans: 47.16 m

Jan 2018

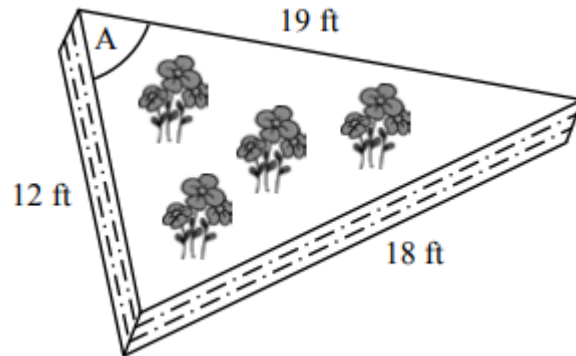
Each letter of the word MULTIPLICATION is written on a different card. The cards are shuffled and placed face down on a table. One card is selected and then replaced.

- A) State the probability of selecting a card with the letter L or P. (1 mark)
- B) State the odds in favour of selecting a card with the letter A. (1 mark)

Ans: A) 0.21 or 21.43% or three out of fourteen or $\frac{3}{14}$

B) 1 : 13 or 1 to 13

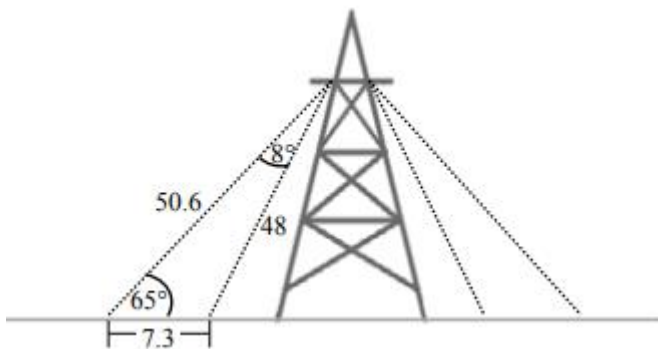
22. George needs to build walls to support his garden. The dimensions of the garden are indicated below.



Determine the measure of angle A in George's garden.

Ans: 66.61°

23. Given the following diagram of a tower with supporting wires:



Identify which of the following is true

A) $\frac{\sin 8^\circ}{48} = \frac{\sin 65^\circ}{50.6}$

B) $\frac{\sin 8^\circ}{50.6} = \frac{\sin 65^\circ}{48}$

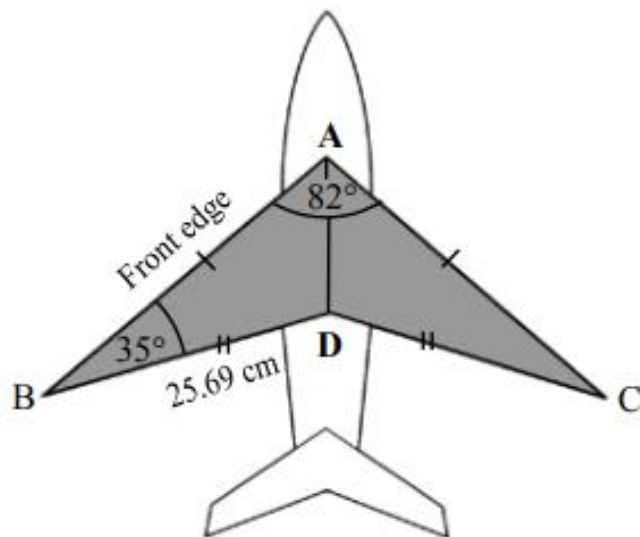
C) $50.6^2 = 7.3^2 + 48^2 - [(2)(7.3)(48)\cos 8^\circ]$

D) $7.3^2 = 48^2 + 50.6^2 - [(2)(48)(50.6)\cos 8^\circ]$

Answer: _____

Answer: D

24. Margo is building a model airplane. The measure of $\angle BAC$ is 82° , \overline{BD} is 25.69 cm and $\angle ABD$ is 35° .



Calculate the length of the front edge of the wing \overline{AB} .

Ans: 37.99 cm

25. The wheelchair ramp illustrated below forms a triangle.

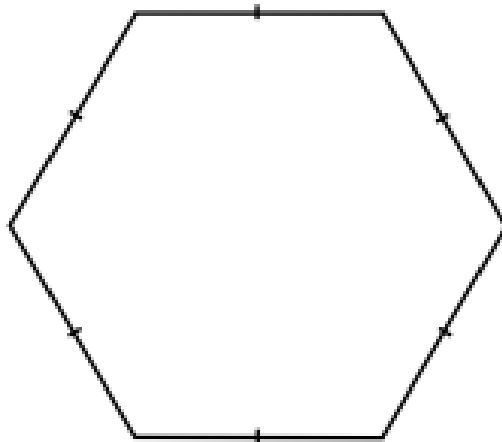


Identify which of the following terms describes this triangle.

- A) equilateral triangle
- B) isosceles triangle
- C) obtuse triangle
- D) right triangle

ANS: D

26. Given the following regular polygon:



Calculate or illustrate the total number of diagonals that can be drawn. If illustrating, clearly state the total number of diagonals.

Ans: 9 diagonals

27. Justify why the following statement is false.

“If a quadrilateral has one pair of parallel sides and one pair of congruent sides, then the quadrilateral must be a parallelogram.”

Think! Can you find a counter example?

Teacher will have lots of other supporting geometry and trigonometry questions as well that you would have done