EUCLIDIAN GEOMETRY TEST

Grade 10
Mathematics
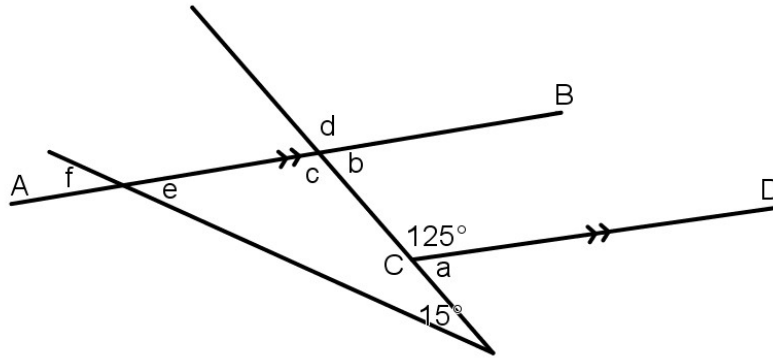Marks: **75**   Name: _____
Time: **1,5 hours**

REFRACTION
www.refractions.co.za

QUESTION 1

R8101

Consider the diagram below. It is given that AB ∥ CD.

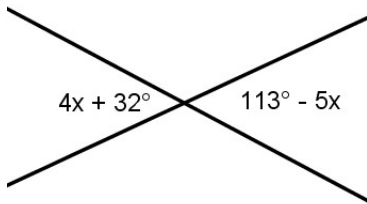Determine the size of a, b, c, d, e and f giving reasons for your statements.   (14)

Statement	Reason

[14]

QUESTION 2

2.1 Study the following diagram.

Determine the value of x with reasons. (3)

Statement	Reason

2.2 Study the diagram below.
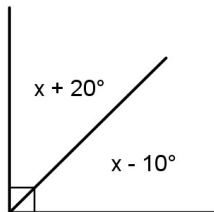
Determine the value of x with reasons. (3)

Statement	Reason

2.3 ABCD is a **Parallelogram**
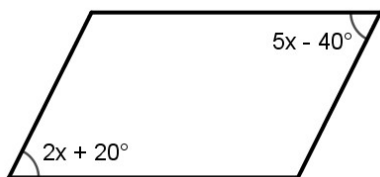
Calculate x with reasons. (3)

Statement	Reason

[9]

QUESTION 3

One summer's day very long ago, two Greek Mathematicians named Pythagoras and his friend Thales of Miletus went for a walk. They walked from the Parthenon past an apple tree and sat down on the grass. At that point they were 5 meters away from the apple tree and 23 meters away from the Parthenon.
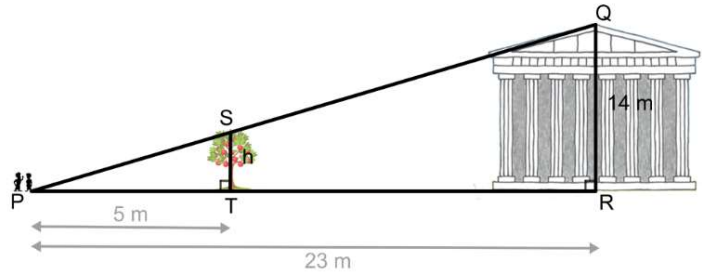
Thales of Miletus: "Pythagoras, how high is the Parthenon?"

Pythagoras: "I think it is 14 m high."

Thales of Miletus: "I bet you can't tell me how far we are from the top of the Parthenon."

Pythagoras: "Challenge accepted! In fact, it is so easy a grade 10 student can do it! Here's how…"

3.1 Do the calculation that Pythagoras would do to show Thales how far they are from the top of the Parthenon. i.e. the length of PQ.

R8102

(2)

3.2 Prove that $\Delta PST \; ||| \; \Delta PQR$

(4) R9102

Pythagoras: "Okay Thales, your turn! Since you are the expert on similar triangles, tell me how high is that apple tree over there."

Thales of Miletus: "Piece of cake!"
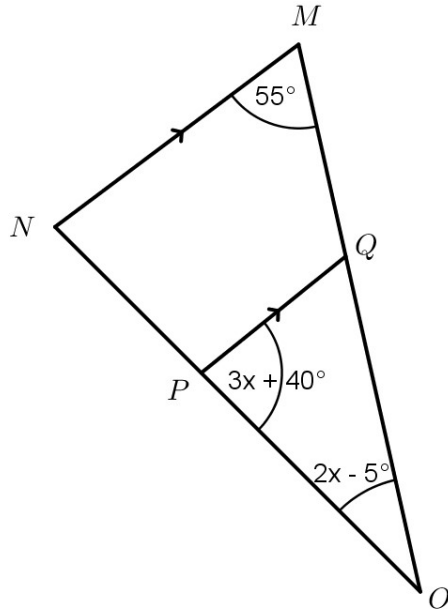
3.3 Calculate the height h of the tree.

(3) R9102

[9]

QUESTION 4

In the diagram below, ΔMNO is drawn.

$MN \parallel QP$, $M\hat{O}N = 55°$, $Q\hat{P}O = 3x + 40°$ and $M\hat{O}N = 2x - 5°$

4.1 Determine the size of $P\hat{Q}O$, giving reasons for your answer. (2) R8101

4.2 Calculate the value of x. Give reasons for your answer. (4) R8101
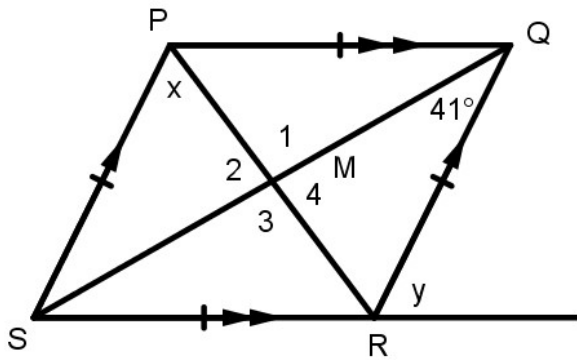
4.3 Calculate the actual size of $M\hat{O}N$. (2)

[8]

QUESTION 5

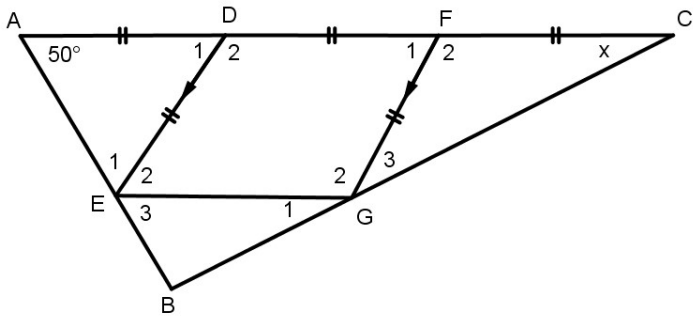5.1 PQRS is a rhombus with diagonals intersecting at M. $S\hat{Q}R = 41°$

5.1.1 Write down the size of $\hat{M}_2$ (1)

5.1.2 Calculate the value of x (5)

5.1.3 Calculate y (4)
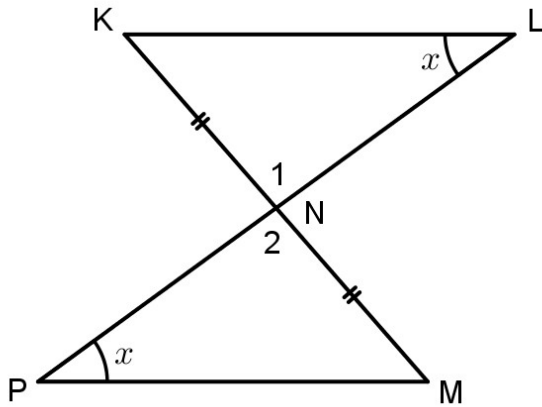
5.2 DEGF is a rhombus.

Calculate the value of x (10)

[20]

QUESTION 6

In the figure KN = NM and $\hat{L} = \hat{P}$.

6.1 Prove that ΔKNL ≡ ΔMNP   (4) R9102

6.2 Hence, prove that NL = PN.   (1)

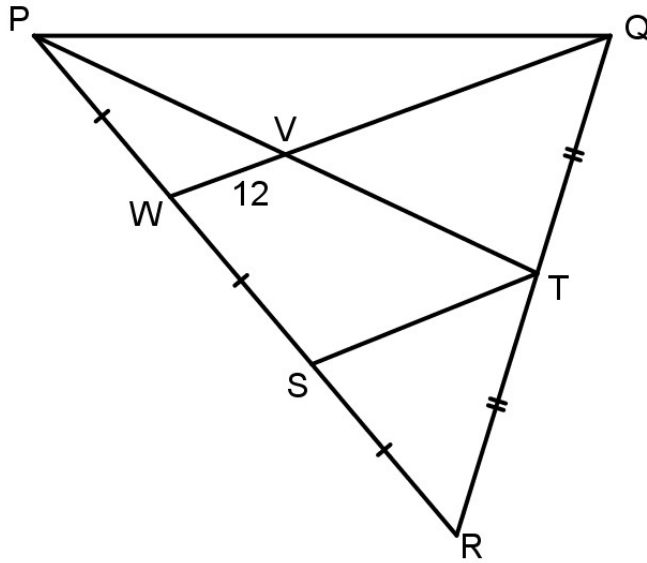6.3 Prove that the quadrilateral, formed by the points K, L, M and P, is a parallelogram. (3) R1101

[8]

QUESTION 7

In ΔPQR: QT = TR, WV = 12 cm and PW = WS = SR.

7.1   Give a reason why ST//WQ.   (1)

7.2   Calculate the length of VQ.   (6)

[7]

Total: 75 Marks