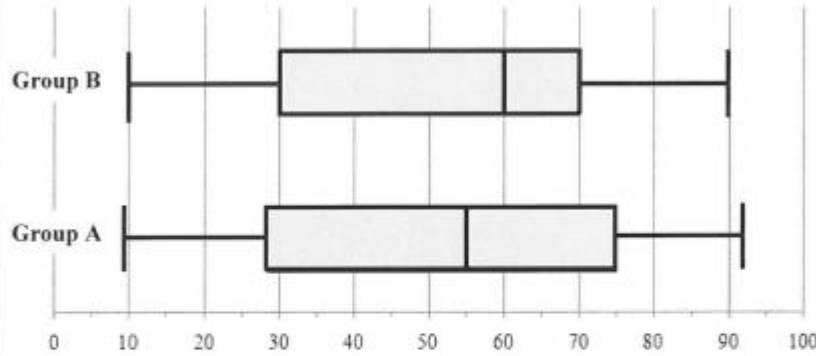**QUESTION 5**

5.1

The two Economics groups, **A** and **B**, at Mphohadi College of Education compared their September 2014 examination results to see which group performed better.

The results of the examination for the two groups are represented by two box and whisker diagrams below:

The arranged percentage marks of group **A** are given below:

9	14	14	19	21	23	33	35	37	37	42	**P**
55	56	57	**Q**	59	75	75	77	78	80	81	92

5.1.1   Calculate the missing values **P** and **Q**, if the mean percentage mark of group **A** is 49,25. (5)

5.1.2   Calculate the probability of randomly selecting a learner from group **A** who obtained a percentage mark of less than 80%. (2)

5.1.3   Explain which group performed better in the examination if both the medians and the interquartile ranges are compared. (7)

QUESTION 4

4.1 During April 2010 Dina, who lived in Limpopo, was studying in Gauteng. She intended getting her driver's licence and analysed the data on learner's licences issued in South Africa as illustrated in TABLE 4 below.

TABLE 4: Total number of learner's licences issued per province in South Africa from 1 April 2009 to 31 March 2010

PROVINCE	CATEGORY OF LEARNER'S LICENCES ISSUED 1 APRIL 2009 TO 31 MARCH 2010			TOTAL
	MOTORCYCLE	LIGHT VEHICLE	HEAVY VEHICLE	
Gauteng	20 533	102 191	293 094	**415 818**
KwaZulu-Natal	4 407	44 637	142 529	**191 573**
Western Cape	15 816	95 681	78 147	**189 644**
Eastern Cape	3 857	38 940	68 793	**111 590**
Free State	3 174	18 500	56 020	**77 694**
Mpumalanga	2 769	11 206	79 077	**93 052**
North West	2 558	15 025	66 265	**83 848**
Limpopo	1 317	8 234	98 151	**107 702**
Northern Cape	1 470	7 757	20 623	**29 850**
Totals	**55 901**	**342 171**	**902 699**	**1 300 771**

[Source: December 2010 Road TrafficReport]

Use TABLE 4 to answer the following questions:

4.1.1 Determine the probability, in decimal form, of randomly choosing a person who was issued a light vehicle learner's licence. (3)

4.1.2 Compare, showing ALL calculations, the ratios of the number of light vehicle learner's licences issued to the number of heavy vehicle learner's licenses issued for both Limpopo and Gauteng. (5)

4.1.3 Explain, showing ALL calculations, why there is a bigger difference in the percentage of all learner's licenses issued in Gauteng compared to learner's licences issued in Limpopo. (4)

4.1.4 Dina used the data in TABLE 4 and performed the following calculation:

$$\textbf{Probability} = \frac{102\ 191}{415\ 818} \approx 25\%$$

She then stated: 'The probability of passing a light vehicle learner's licence test in Gauteng is approximately 25%.'

Explain why Dina's statement or calculation is INCORRECT. (3)

QUESTION 3

3.1

> Greenland is an island between the Arctic Ocean and the North Atlantic Ocean.
> Some facts about Greenland:
>
> - Total land area: 2 166 086 square km.
> - 81% of Greenland is ice-capped.*
> - The coastline is 44 087 km.
> - North-south length of approximately 2 655 km or 1 650 miles and an east-west length of 1 290 km.
> - Population of 56 370.
> - Nuuk is the capital city.
> - Qaanaaq is the northern-most town which is best known for its Inuit culture and for the 24 hours midnight sun that lasts for from 25 April to 18 August.
>
> *[Midnight sun is a time of the year when the sun never sets because Greenland is so far north.]*
>
> *Area fully covered by ice.
>
> [Source: wikipedia.org]

Use the information above to answer the following questions:

3.1.1	Calculate the conversion factor used to convert kilometres to miles.	(2)
3.1.2	Explain why the total land area of Greenland cannot be calculated by merely multiplying the north-south length by the east-west length.	(2)
3.1.3	A tourist to Qaanaaq would like to experience the midnight sun. Calculate the total number of days during which it is possible to experience the midnight sun.	(4)

3.2   A map showing the population distribution in Greenland is given on ANNEXURE C.

Use this map and the information in QUESTION 3.1 to answer the following questions:

3.2.1   Calculate the population density of Greenland.

You may use the following formula:

$$\text{Population density} = \frac{\text{total number of persons living on the island}}{\text{ice-free area (in km}^2)}$$

(4)

3.2.2	Estimate the size of the indigenous population who lived in Nuuk during 2003.	(3)
3.2.3	Determine the number of towns which have a population of less than 2 000.	(2)

QUESTION 2

2.1 | Elizabeth visited Darwin in Australia and used a tourist map, shown on ANNEXURE A, to help her find her way during her stay. She stayed in a hotel in Bennett Street.

Use the map on ANNEXURE A to answer the following questions:

2.1.1   In which general direction is the central business district (CBD) from the airport?   (2)

2.1.2   Elizabeth walked from her hotel along the Esplanade to do some sight-seeing.

Name TWO places of interest that she will see along the Esplanade.   (2)

2.1.3   Elizabeth then walked back to her hotel and hired a taxi to take her to the Casuarina Shopping Centre. The taxi driver told her he would travel along Bennett Street and continue on Tiger Brennan Drive and on Vanderlin Drive until they reached the shopping centre.

Elizabeth looked at her map and noted that there was a much shorter route to the shopping centre.

Describe this shorter route to the shopping centre.   (4)

2.1.4   She used Google Maps on the Internet and noted that the distance from Bennett Street to the Casuarina Shopping Centre is 12,4 km showing a travelling time of 18 minutes, as shown in the picture below:
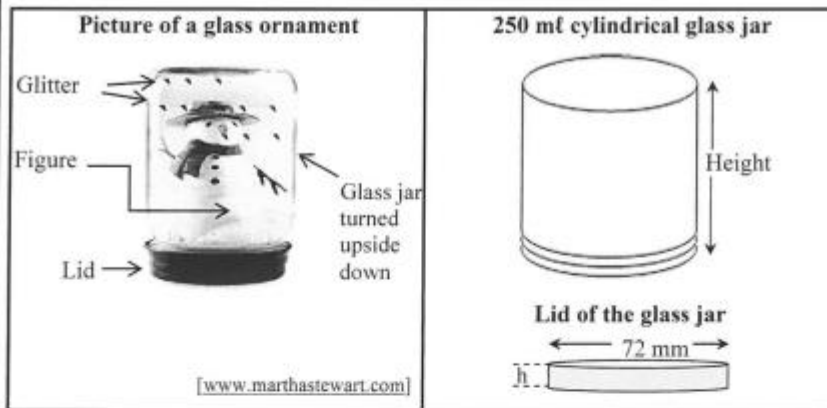
🚗 18 min
12,4 km

Determine, showing ALL calculations, whether the information shown by Google Maps indicates that the travel time is due to slow traffic flow.

You may use the formula:

Distance = average speed × time   (4)

2.3 Below is a photograph of a glass ornament that Petru makes using 250 mℓ cylindrical glass jars.

Picture of a glass ornament	250 mℓ cylindrical glass jar
Glitter Figure Glass jar turned upside down Lid → [www.marthastewart.com]	Height **Lid of the glass jar** ← 72 mm → h

The inside radius of the glass jar is 3,25 cm.
The outside diameter of the lid of the jar is 72 mm and the height (h) is 9 mm.

The exterior surface of the lid is painted red.
The jar is filled 75% with water and a pinch of glitter is added to the water. A dash of glycerine is also added to keep the glitter from sinking too quickly.
The figure is glued to the inside of the lid before the lid is placed on the jar. The jar is then turned upside down.

2.3.1 Calculate (to the nearest cm²) the exterior surface area of the lid that needs to be painted.

You may use the following formula:

Painted exterior surface area of lid = $\pi r (r + 2h)$
where $\pi = 3,142$; **r** is the radius and **h** is the height of the lid. (4)

2.3.2 Determine (to the nearest cm) the height of the water in the jar before the lid is placed on the jar.

You may use the following formula:

Height of the water in the jar $= \dfrac{\text{volume of the water (in cm}^3)}{\pi \times (\text{radius})^2}$

$1 \text{ cm}^3 = 1 \text{ mℓ}$ (6)

2.3.3 Use the conversions below to answer the following questions.

1 pinch	=	$\dfrac{1}{16}$ teaspoon
2 pinches	=	1 dash
1 teaspoon	=	5 mℓ

Determine what fraction of a teaspoon equals ONE dash. (2)