| EXAMINATION | NATIONAL SENIOR CERTIFICATE |
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| **GRADE** | 12 |
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| **MARK TOTAL** | 150 |
| **DURATION (HOURS)** | 3 |
| **NUMBER OF PAGES** | 16 |

SOUTH AFRICAN COMPREHENSIVE ASSESSMENT INSTITUTE

SUID-AFRIKAANSE KOMPREHENSIEWE ASSESSERINGSINSTITUUT

## INSTRUCTIONS AND INFORMATION

1. This question paper consists of 4 questions and 16 pages.

2. Answer **ALL** the questions.

3. Number the answers according to the numbering system used in the question paper.

4. Start each question on a new page.

5. An approved non-programmable and non-graphical calculator may be used.

6. Show **ALL** calculations clearly.

9. Round **ALL** final answers off according to the context, unless stated otherwise.

8. Indicate **ALL** units where applicable. Units **MUST** be shown in final answers.

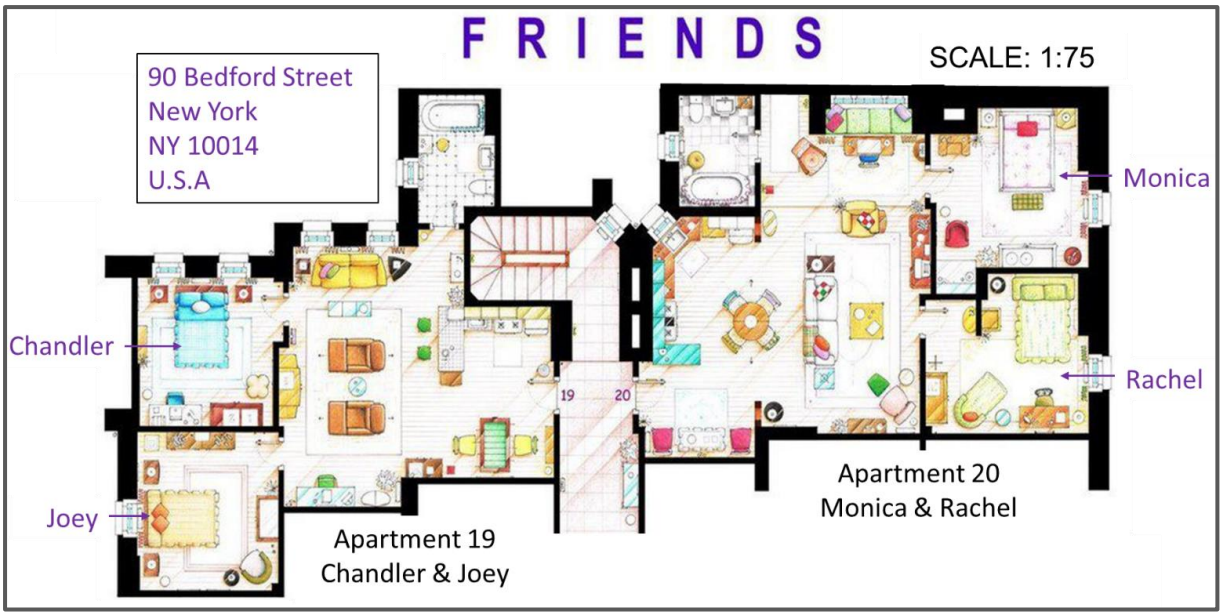
9. Maps and diagrams are **NOT** necessarily drawn to scale, unless stated otherwise.

10 Write neatly and legibly in **BLUE** ink **ONLY**.

## QUESTION 1

1.1 Iñaki Aliste Lizarralde, is a 45-year-old designer from Azpeitia, Spain, who draws floor plans *(not on scale)* of homes in popular movies and television shows to sells them on Etsy. The most popular floor plan is, without a doubt, the apartment from "Friends." On average, an apartment bedroom is 132 square feet in the US. Legally, a bedroom should be at least 70 square meters. In New York, for example, the average apartment bedroom has the dimensions of 11 by 12 feet.

*[Source adapted from: https://design-tips.floorplanner.com/what-is-the-average-size-of-a-bedroom/]*




Study the information above to answer the following questions.

1.1.1 Choose the correct **WORD** between the brackets to complete the following sentence:

*"This plan represents two apartments in a building on* ***(Bedford/ New York)*** *street."* (2)

1.1.2 Select the correct **LETTER** that makes the following statement **TRUE.**

Write **ONLY** the letter down e.g. D.

The artist, Iñaki Aliste Lizarralde, draws the homes of popular movies and television shows and sells them. These home drawings are called:

| | | |
|---|---|---|
| **A** – Maps | **B** – Floor plans | **C** – Model |

(2)

1.1.3 Write down the scale of this drawing. (2)

1.1.4 Choose the correct **WORD** inside the brackets, that will complete the sentence accurately.
The scale on this drawing is an example of a ***(number / bar)*** scale. (2)

1.1.5 How many bathrooms does apartment 20 have according to the drawing? (2)

1.1.6 According to this drawing there are 10 rooms in total between the two apartments. Calculate the probability, as a fraction, of selecting a bedroom out of all the rooms. (2)

1.1.7 Choose the correct **WORD** between the brackets to complete the following sentence accurately: *"From observation view, of the drawing,* ***(Joey / Rachel)*** *has the biggest bedroom area."* (2)

1.1.8 State if the following statement is **TRUE** or **FALSE**.
*"According to the artist, all his drawings are drawn to scale."* (2)

1.1.9 Choose the correct **WORD** inside the brackets, that will complete the sentence accurately. *"Joey's bedroom is* ***(square / rectangular)*** *shaped."* (2)

1.1.10 Select the correct **LETTER** that makes the following statement **TRUE**.
Write **ONLY** the letter down e.g. D. To calculate the perimeter of Joey's bedroom we would use the following formula:

| A | B | C |
|---|---|---|
| 2 × L + 2 × B | 2 × L × B | L × B |

(2)

1.1.11 If Joey's bedroom has the average apartment dimensions of 11 by 12 feet.
Select the correct calculation from the following table to calculate the area of his room in square feet. Write **ONLY** the correct **LETTER,**
e.g. D.

| A | B | C |
|---|---|---|
| $11^2 \times 12^2$<br>= 17 424 square feet | 2(11 × 12)<br>= 264 square feet | 11 × 12<br>= 132 square feet |

(2)

1.2 State if the following statement is **TRUE** or **FALSE**. *"Sam buys a Friends Poster from Etsy for $15,99. The exchange rate is $1 = R18,21, therefore it costs R291,18."*

(2)

1.3 Friends is an American television sitcom created by David Crane and Marta Kauffman, which aired on NBC from September 22, 1994, to May 6, 2004. Friends received acclaim throughout its run, becoming one of the most popular television shows of all time. This table depicts the total time it takes to watch each Friends season.

| **Friends** | **Total In Minutes** | **Total In Hours** |
|---|---|---|
| **Season 1** | 528 Minutes | 8 Hours 48 Minutes |
| **Season 2** | 528 Minutes | 8 Hours 48 Minutes |
| **Season 3** | 549 Minutes | 9 Hours 9 Minutes |
| **Season 4** | 528 Minutes | 8 Hours 48 Minutes |
| **Season 5** | 527 Minutes | 8 Hours 47 Minutes |
| **Season 6** | 530 Minutes | 8 Hours 50 Minutes |
| **Season 7** | **A** | 8 Hours 25 Minutes |
| **Season 8** | 506 Minutes | 8 Hours 26 Minutes |
| **Season 9** | 577 Minutes | 9 Hours 37 Minutes |
| **Season 10** | 435 Minutes | 7 Hours 15 Minutes |
| **TOTAL** | **5 213 Minutes** | **B** |

*[Source adapted from: https://www.endlesspopcorn.com/friends-watch-time-guide/]*

Study the information above to answer the questions.

1.3.1 How many seasons of the show *Friends* are there? (2)

1.3.2 Determine the total minutes, value **A**, of season 7 on this list. (2)

1.3.3 Choose the correct calculation for, missing value **B**, from the following list. Write **ONLY** the **LETTER**, e.g. D.

| | |
|---|---|
| **A** | 5 213 Minutes ÷ 60 = 86,88 ≈ 86 hours 88 minutes |
| **B** | 5 213 Minutes ÷ 60 = 86,88 ≈ 86 hours 53 minutes |
| **C** | 5 213 Minutes ÷ 60 = 86,88 ≈ 87 hours 28 minutes |

(2)

**[30]**

## QUESTION 2

2.1 Lara makes handmade Rainbow Swirl Lollipops and sells them to candy shops. She uses the following recipe to make her Rainbow Swirl Lollipops:

### How to Make Swirl Lollipops

**Ingredients:**

84,64 ounces of sugar
33,79 fluid ounces water
14,12 ounces of corn syrup
6,25 ml cream of tartar
1g Food Colour per colour
4g Strawberry Flavour

**Time:**

**Preparation:** 5 minutes
**Cooking:** 25 minutes

**Serving options:**

12 – Small Lollipops (5 cm diameter)
10 – Medium Lollipops (100 mm diameter)
4 – Large Lollipops (5,9 inch diameter)

**Steps:**

1. Pour the sugar, corn syrup, water and cream of tartar into the large saucepan. Stir the mixture together until it is mixed well, and the sugar is dissolved completely.
2. Insert the candy thermometer into the mixture and cook the mixture until the temperature on the candy thermometer reads 266 ºF. Do not stir the mixture while it is cooking.
3. Remove the pan from the heat and add the flavoring extract. Separate the mixture into the number of colors needed onto a cooling mat. Mix the food coloring into the mixtures. Allow the candy to cool just enough to handle without burning yourself.
4. Put on your silicone gloves pull and fold the candy portions repeatedly, until the candy looks glossy.
5. Roll each piece of candy into a thin rope. Wrap the candy ropes around each other.
6. Roll the bigger piece of candy together into another thin rope.
7. Create the circle swirl shape by coiling the candy rope around itself until you've achieved the desired size.
8. Place the candy swirl onto a greased cookie sheet and press a lollipop stick firmly into the candy.
9. Allow the candy to cool completely, until it is hard and set, then enjoy.

*[Source adapted from: https://www.leaf.tv/articles/how-to-keep-candy-apples-fresh/]*

Study the information above to answer the questions.

2.1.1 How long does it take to make this recipe? (2)

2.1.2 Convert the sugar in ounces to kilograms if, one ounce is equal to 28,3495 grams. Round your answer to the **ONE** decimal place. (4)

2.1.3 Calculate how many cups of water this recipe uses if, 1 cup is equal to 250 millilitres and one fluid ounce is equal to 29,5735 millilitres. Round your answer off to the nearest cup. (4)

2.1.4 Convert the temperature in degrees Fahrenheit to degrees Celsius.

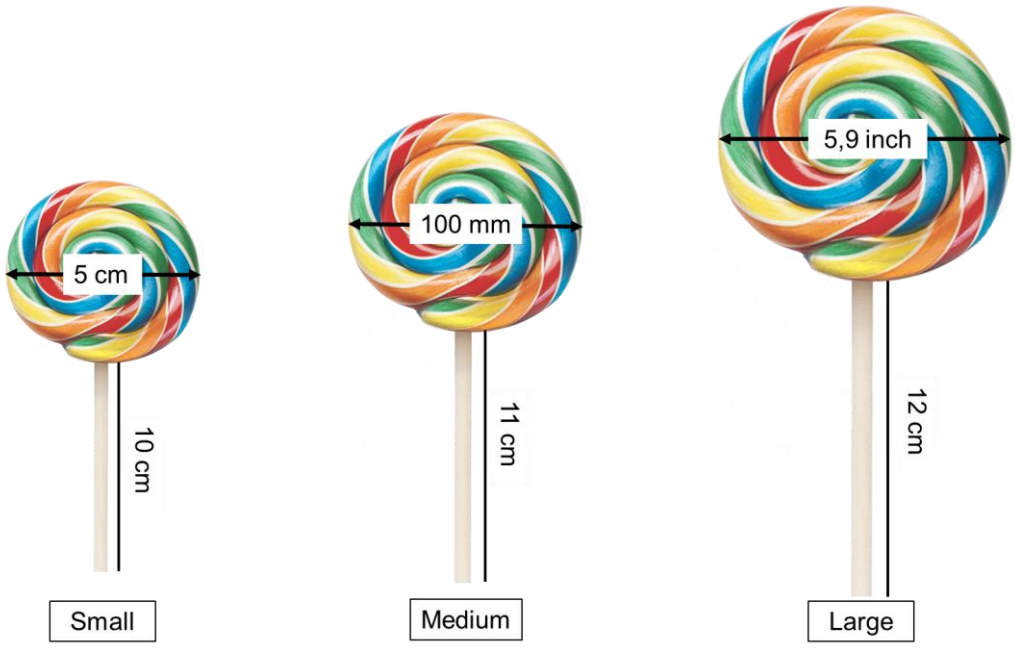
Use the following formula: $℃ = \frac{5}{9} \times (℉ - 32°)$ (2)

2.1.5 Write the ratio of the serving sizes, small and large, in simplest form. (3)

2.1.6 It costs R106,02 to make this recipe. Lara wants to sell the small lollipop for R15,00. Calculate how much profit she would make if she sold 21 small lollipops. Use the following formula.

**Profit = Income – Expenses** (4)

2.2 Lara made the following diagram with dimensions to help her make decisions about her Rainbow Swirl Lollipop presentation and packaging. The Lollipop stick is 15 cm long.




Study the information above to answer the following questions.

2.2.1 Determine the radius of the Medium Rainbow Swirl Lollipop in centimetres. (3)

2.2.2 Convert the diameter of the Large Rainbow Swirl Lollipop to centimetres if, 1 inch is equal to 2,54 centimetres. Round your answer to the nearest centimetre. (3)

2.2.3 Calculate the circumference of the Small Rainbow Swirl Lollipop. Use the following formula:

$$\boldsymbol{Circumference = 2\pi r, where\ \pi = 3,142}$$

(3)

2.2.4 Lara states that the area of the Small Rainbow Swirl Lollipop is 4 times Smaller than the area of the Large Rainbow Swirl Lollipop. Calculate the area of the Small and Large Rainbow Swirl Lollipop to validate her statement. Use the following formula:

$$\boldsymbol{Area = \pi r^2, where\ \pi = 3,142}$$

(6)

2.2.5 Complete the following statement by choosing the correct word between brackets. *"The **(area/perimeter)** of a shape is the total length around the shape."*

(2)

2.3 Lara is looking for a new distributor for her large lollipop plastic bags. The plastic packaging must allow for 1 cm of leeway on all the sides of the lollipop and a minimum of 2 cm at the bottom of the packet to tie it onto the lollipop stick. She finds the following:


*Source adapted from: https://www.ebay.com.au/b/Resealable-Packing*

Use the information to answer the following questions.

2.3.1 Determine the width of the plastic bag needed to cover the Large Rainbow Swirl Lollipop according to Lara's specifications. (3)

2.3.2 Calculate the length of the plastic bag needed to cover the Large Rainbow Swirl Lollipop according to Lara's specifications. (3)

2.3.3 Lara states that the best size option to take will be the 17 x 17 cm option. Using your previous calculations advise Lara if she has chosen the correct size option or not. Give a reason for choosing your size option. (4)

2.2.4 Lara decides to buy plastic bags for her small, medium and large lollipops. The total cost for her purchase is R159,87 excluding VAT. Calculate how much this purchase will cost including VAT. (3)

2.2.5 Determine the probability, as a percentage, of choosing a plastic bag with a width of 8 cm out of all the plastic bag options. (3)

**[52]**

## QUESTION 3

3.1 Yellowstone National Park, had its 150th birthday in 2022, and visitors from around the world was expected for this celebration. The 2,2 million-acre (3468,4 sq. miles) park is visited by more than 4 million people every year. The park is known for its stunning wilderness landscapes, abundant wildlife, geothermal features and compelling human history.


A majority of the park (96%) is in the state of Wyoming. A small section of the park (3%) to the North and North-West is in the state of Montana and a small section of the park (1%) to the West is in the state of Idaho.

*[Source adapted from: https://www.yellowstonepark.com/park/faqs/where-is-yellowstone-national-park/]*

Study the above-mentioned information to answer the following questions.

3.1.1 In what year did Yellowstone National Park open its gates? (2)

3.1.2 Choose the correct word between brackets to correctly complete the following sentence. *"Yellowstone National Park can be found in the* ***(North/East/South/West)*** *Western region of the United States."* (2)

3.1.3 Across how many states does the Yellowstone National Park lie? (2)

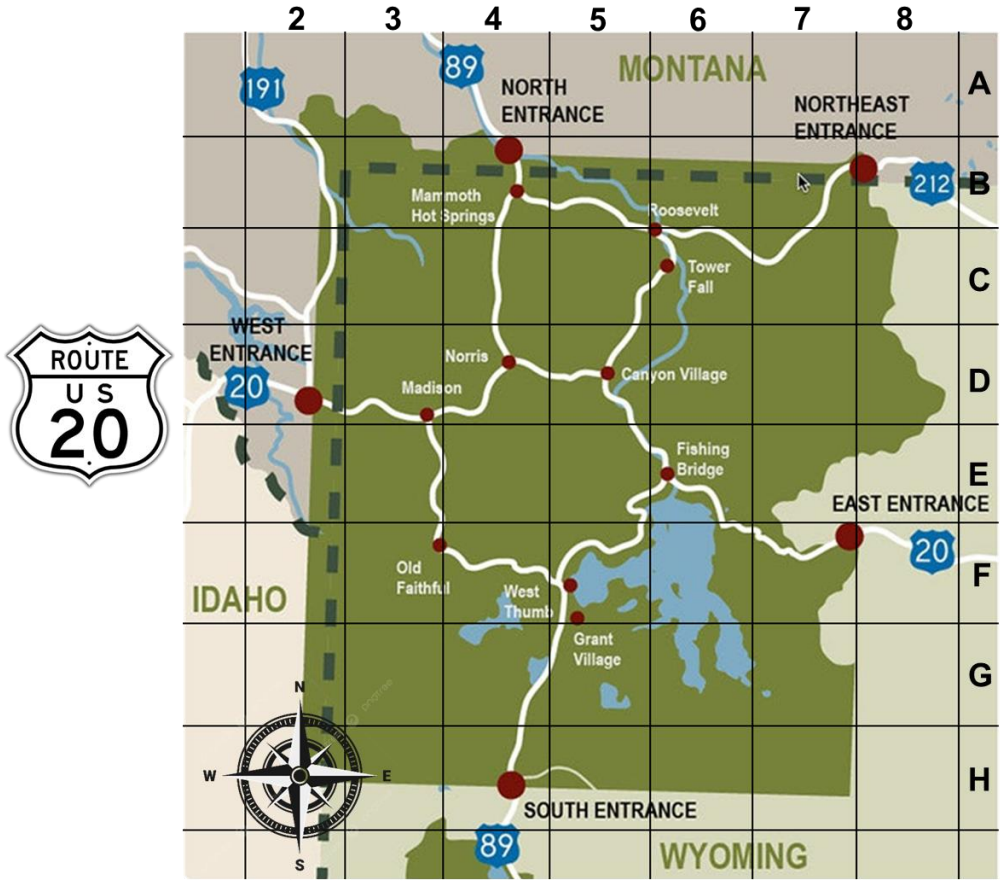
3.1.4 Calculate how many acres of the Yellowstone National Park lies in Montana. (3)

3.1.5 Convert the area of Yellowstone National Park to the nearest square kilometres, if 10 $km^2$ = 3,86102 square miles. (5)

***QUESTION 3.1.6 FOLLOWS ON THE NEXT PAGE…***

3.1.6 According to the article the area of the Yellowstone National Park is given as 2,2 million-acres or 3468,4 square miles. If one square mile is equal to 640 acres, convert the area in acres to square miles and the square miles to acres in order to compare whether these values are correctly linked via the scale factor. Give a reason for your answer. (8)

3.2 Yellowstone park is enormous, which is why it's a good idea to figure out what you want to see and know which entrance is closest to those sights. Yellowstone has eight developed visitor areas with visitor centres, lodging, and museums. These include: Mammoth Hot Springs, Tower-Roosevelt, Canyon Village, Fishing Bridge, West Thumb, Grant Village, Old Faithful, and Madison.




*[Source adapted from: https://www.yellowstonepark.com/road-trips/gateway-towns/]*

Study the information to answer the questions that follow.

3.2.1 Name two roads that travel through Yellowstone National Park. (2)

3.2.2 Mention **ONE** road that does not enter into Yellowstone National Park. (2)

3.2.3 How many entrances does Yellowstone National Park have. (2)

3.2.4 Which entrance will you find in grid reference D2. (2)

***QUESTION 3.2.5 FOLLOWS ON THE NEXT PAGE…***

3.2.5 Give the grid reference for the Northern Entrance. (2)

3.2.6 In what general direction is Madison from Roosevelt? (2)

3.2.7 What state lies to the South of Montana? (2)

**[36]**

## QUESTION 4

4.1 The Thomson family are spending their summer holiday travelling through Yellowstone National Park. They use the following distance table and map for their journey.

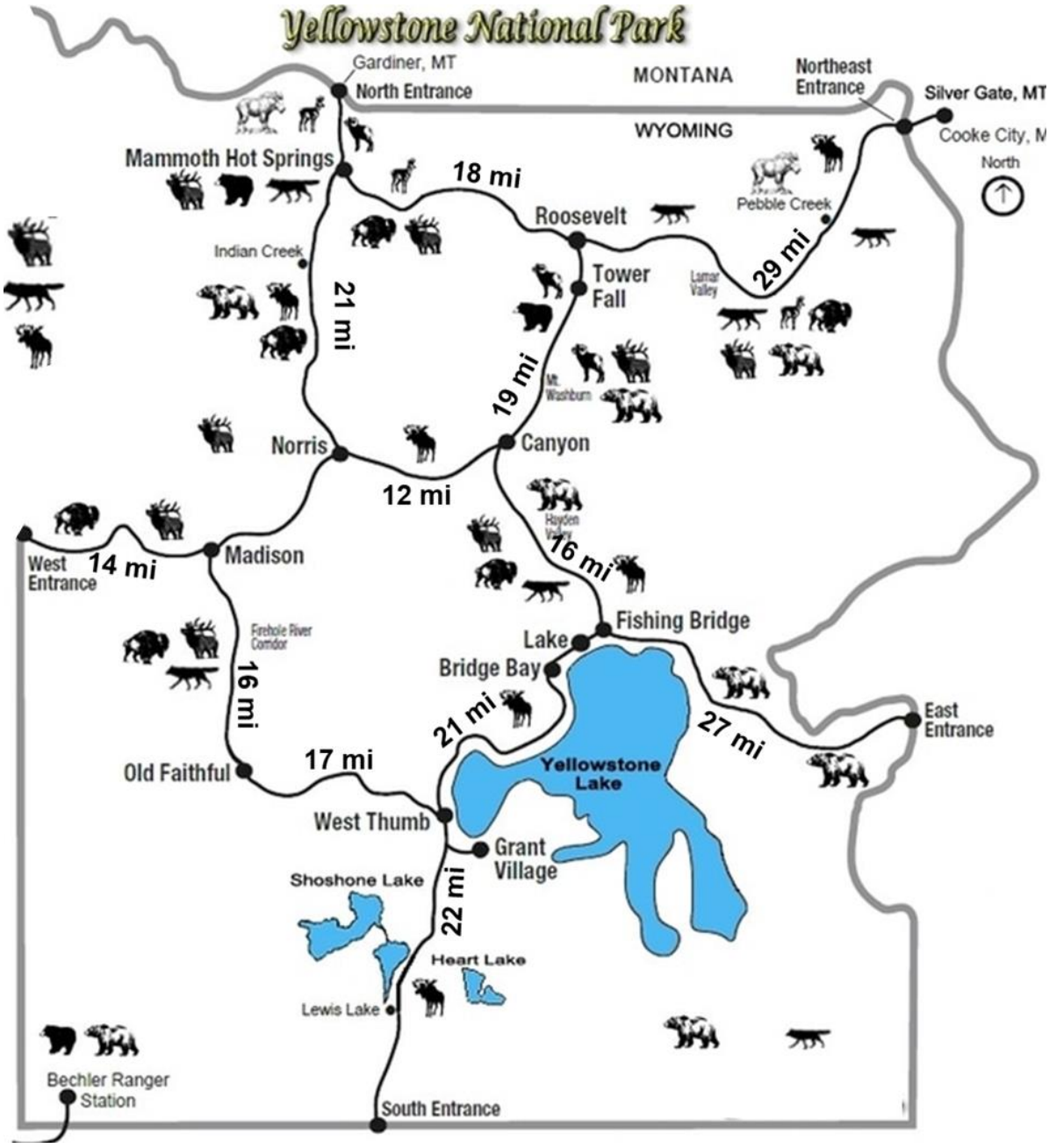
**Distance Table:**

| Distance in miles between locations | East Entrance | Fishing Bridge | West Thumb | Old Faithfull | Madison | Norris | Mammoth | Roosevelt | North East Entrance |
|---|---|---|---|---|---|---|---|---|---|
| **East Entrance** | | 27 | 48 | 65 | 81 | 95 | 116 | 134 | 163 |
| **Fishing Bridge** | 27 | | 21 | 38 | 54 | 68 | 89 | 107 | 136 |
| **West Thumb** | 48 | 21 | | 17 | 33 | 47 | 68 | 86 | 115 |
| **Old Faithfull** | 65 | 38 | 17 | | 16 | 30 | 51 | 69 | 98 |
| **Madison** | 81 | 54 | 33 | 16 | | A | 35 | 53 | 82 |
| **Norris** | 95 | 68 | 47 | 30 | A | | 21 | 39 | 68 |
| **Mammoth** | 116 | 89 | 68 | 51 | 35 | 21 | | 18 | 47 |
| **Roosevelt** | 134 | 107 | 86 | 69 | 53 | 39 | 18 | | 29 |
| **North East Entrance** | 163 | 136 | 115 | 98 | 82 | 68 | 47 | 29 | |

*[Source adapted from: https://www.yellowstonepark.com/park/national-park-maps]*

***THE MAP FOLLOWS ON THE NEXT PAGE …***

**Map of Yellowstone:**




They decided to enter at the East entrance travelling to Fishing Bridge, West Thumb, Old Faithful, Madison, Norris Mammoth Hot Springs, Roosevelt and exit the park through the North East entrance.

*[Source adapted from: https://www.yellowstone.co/gettinghere.htm]*

Study the above-mentioned map and table to answer the following questions.

4.1.1 Choose the correct word between brackets to correctly complete the following sentence. The likelihood of seeing a Mountain Goat increases to the ***(North, East, South, West)*** of the park. (2)

4.1.2 Use the map to calculate the total distance travelled from the East Entrance to Madison in miles. Show all your calculations. (2)

4.1.3 Use the distance table to determine the distance between Madison and Norris, the missing value A. Show all your calculations. (3)

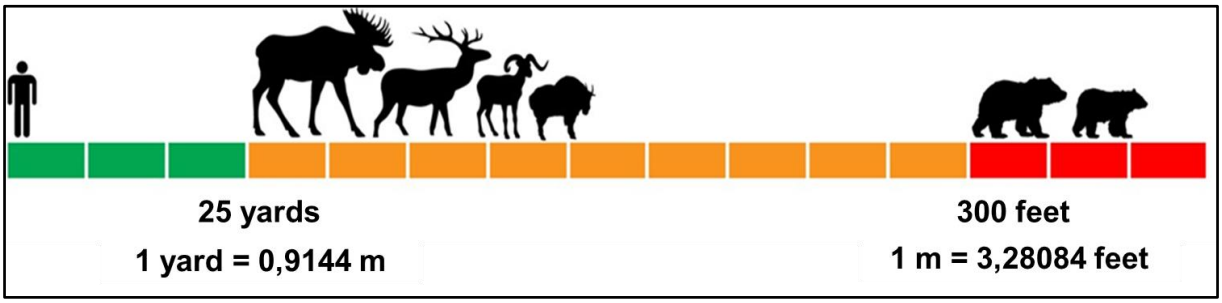
4.1.4 Mr Thomson states that the drive from Old Faithful to the North-East Entrance will take them 2 hours 45 minutes and 10 seconds. The average speed you can travel is 45 mph. Calculate how long it would take to travel from Old Faithful to the North-East Entrance to validate his statements. Write your answer in hours, minutes and seconds.

**Time = Distance ÷ Speed** (6)

4.1.5 Determine the map scale for this map, if the ruler measurement between Norris and Mammoth Hot Springs is 4,5 cm round off to the nearest ten thousand place. (5)

4.1.6 The road between Roosevelt and Canyon is closed due to construction. Determine how much further a visitor must travel to Roosevelt from Canyon. (4)

4.2 The Thomson family decide to camp for a few days before they exit through the North-East entrance. They were advised to always enjoy wildlife from the safety of their car or from a safe distance and not to approach wildlife to take photographs. Bears, mountain lions, goats, deer, or any other species of wildlife can present a real threat, especially females with young. They were shown the following the sign:




[*Source adapted from: https://www.nps.gov/glac/planyourvisit/wildlifesafety.htm]*

***Study the maps above to answer the questions ON THE NEXT PAGE.***

4.2.1 Name the type of scale used in the sign. (2)

4.2.2 According to the sign Mr Thomson states that the safe distance between you and a Moose is 23 m, and a Bear is 50 m. Calculate the safe distance between you and a Moose, and a Bear in metres to validate his statement. (8)

**[32]**

## GRAND TOTAL: [150]



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