
Part 1: PROBABILITY - Answer 3 of the following 4 questions. Each question is worth 3 points in this part.

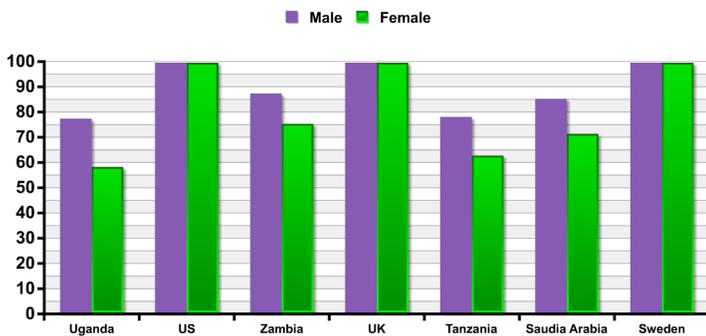
- 1) Two dice are rolled simultaneously. Find the probability of rolling a sum of at most five.
- 2) A bag contains three red, four blue, and five white marbles. If one marble is selected at random, put back in the bag, and then a second marble is chosen find the probability of selecting two white marbles.
- 3) A card is selected at random from a standard deck of cards. Find the probability of selecting a black two.
- 4) The letters from the word CHRISTMAS are all placed faced down on cards on a table. Find the probability of selecting the letter "S" on the first pick and the letter "R" on the second pick if the first card selected is removed from the table after it is selected.

Part 2: COMBINATIONS and PERMUTATIONS – Answer 2 of the following 3 questions in this part. Each question is worth 3 points. Put a check next to the two problems that you want graded.

- 1) Find the number of distinguishable permutations that can be made from the letters of the word INDIANA.
- 2) From a group of sixteen equally qualified candidates, a committee of four is to be chosen. In how many ways can the committee be formed?
- 3) From a group of twelve seniors, a cross-bearer, flag-bearer, lector, and an assistant are to be chosen for mass. In how many ways can the selections be made?

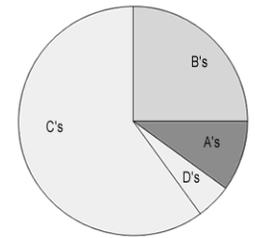
Part 3: CHARTS and TABLES - You must answer these two problems. Each problem is worth 10 points for a total of 20 points.

1. This bar graph compares the percentage of each gender that had access to the internet either publically or privately in 2015. Use it to answer the following questions.
Note – for each country displayed, the first bar represents the percentage of men and the second the percentage of women



- a) Find the approximate percentage of women in Tanzania that had access to the internet in 2015.
- b) Find the approximate percentage of men in the UK that had access to the internet in 2015.
- c) Of the countries given, which country's women had the lowest percentage of access to the internet in 2015?
- d) What is the ratio of the percentage of men that had access to the internet in 2015 in Saudia Arabia to the percentage of women in the same country?

2. Use the pie chart to the right to answer the following questions.
The pie chart demonstrates the grades that students received last semester in chemistry.



- The largest percentage of students received what grade?
- The smallest percentage of students received what grade?
- Estimate what percentage of the class received a B.
- If there was 100 students that took chemistry last year, which of the following statements is FALSE:
 - 25 students earned a grade of B.
 - 57 students earned a grade of C.
 - 33 students earned a grade of D.
 - Over $\frac{3}{4}$ of the students earned at least a grade of C.

Part 4: TRIANGLE TRIGONOMETRY: Answer one of the following two problems. The problem is worth 15 points.

- 1) In ΔABC , $\angle A = 90^\circ$, $b = 15$ and $c = 20$. Using SOHCAHTOA find:
- | | | |
|----------------------|----------------------|----------------------|
| 1) $\sin B =$ _____ | 2) $\cos B =$ _____ | 3) $\tan B =$ _____ |
| 4) $\cot B =$ _____ | 5) $\sec B =$ _____ | 6) $\csc B =$ _____ |
| 7) $\sin C =$ _____ | 8) $\cos C =$ _____ | 9) $\tan C =$ _____ |
| 10) $\sec C =$ _____ | 11) $\csc C =$ _____ | 12) $\cot C =$ _____ |

2) SOLVING A TRIANGLE: In ΔDEF , $\angle E = 30^\circ 42'$, $f = 35.2$ and $e = 29.7$. Find the remaining angles to the nearest minute and the remaining side to the nearest tenth.

Part 5: FINDING SIDES OF A TRIANGLE – Answer 2 of the 3 questions in this part. Each problem is worth 15 points for a total of 30 points.

- In ΔABC , $C = 90^\circ$, $a = 26.3$ and $B = 42^\circ 35'$. Find the remaining sides to the nearest tenth.
- In ΔDEF , $D = 123^\circ 10'$, $f = 30$, and $e = 21$. Find d to the nearest tenth.
- In ΔGHI , $G = 92^\circ 50'$, $I = 58^\circ 20'$, and $h = 16$. Find g to the nearest tenth.

Part 6: TRIGONOMETRY WORD PROBLEMS: Answer 1 of the following 2 questions in this part. The problem you choose is worth 20 points.

- A telephone pole is placed into a hill and makes a $85^\circ 12'$ angle with the ground. A wire is attached to a point on the pole 37.2 above the ground and is attached to the ground. The wire's length is 45.4 feet,
 - Find the angle the wire makes with the pole to the nearest minute.
 - Find to the nearest tenth of a foot, the distance from point the wire meets the ground to the foot of the telephone pole.
- A man standing on a beach spots two boats out at sea. The distance between the boats is 350 meters, and the distance from the man to the closer of the two boats is 300 meters. If the angle formed at the closer boat contains $65^\circ 19'$. Find:
 - The distance from the man to the further boat.
 - The angle formed at the further boat (to the nearest minute).

HAVE A VERY MERRY CHRISTMAS AND A HAPPY AND HEALTHY NEW YEAR!!!!!!