Mathsbase Exam Mini Mock 55 Minutes

Question 1:

Answer: _____

1) Solve the simultaneous equations: $3x + 2y = 8$ $4x - y = 10$ (4 marks) Question 2:

Answer: _____

2) Shown below is the graph of the quadratic inequality $y > x^2 - x - 6$. Shade the region that represents the solution set on the graph. (2 marks) (diagram: x and y axes, parabolic curve: $y = x^2 - x - 6$) Question 3:

Answer: _____

3) The angle of elevation of a helicopter from a point P on the ground is 37°. The helicopter is flying directly towards another point Q. The angle of elevation of the

helicopter from Q is 53°. Find the distance between P and Q, correct to two decimal places. (4 marks) Question 4:

Answer: _____

4) Solve the equation $\sin(x) = \cos(x)$ for x between 0° and 360°. (3 marks) Question 5:

Answer: _____

5) Given a right-angled triangle ABC, where angle $A = 30°$ and $AB = 12$ cm. Find the length of BC, correct to two decimal places. (3 marks) Question 6:

Answer: _____

6) The ratio of boys to girls in a class is 4:3. If there are 28 students in total, calculate the number of boys in the class. (2 marks) Question 7:

Answer: _____

7) A car initially travels at a speed of 60 km/h. After 2 hours, it increases its speed by 20%. Calculate the final speed of the car. (3 marks) Question 8:

Answer: _____

8) The population density of a city is 2500 people per square kilometer. If the area of the city is 40 square kilometers, calculate the total population of the city. (3 marks) Question 9:

Answer: _____

9) In a rectangle, the length is twice the width. If the perimeter of the rectangle is 48 cm, calculate the length and width of the rectangle. (4 marks) Question 10:

Answer: _____

10) Circle theorem question: In the given diagram, O is the center of the circle and AB is a tangent to the circle at point B. Find the value of angle x. (3 marks) A-----B | | | O | | | C-----D Question 11:

Answer: _____

11) A box contains 5 red balls, 3 blue balls, and 2 green balls. What is the probability of randomly selecting a blue ball, replacing it, and then selecting a green ball? Express your answer as a fraction in its simplest form. (3 marks) Question 12:

Answer: _____

12) In a bag there are 4 red balls, 3 blue balls, and 2 green balls. A ball is randomly chosen and removed. Then, a second ball is randomly chosen and removed. Calculate the

probability that the first ball chosen is blue and the second ball chosen is green. (4 marks) Question 13:

Answer: _____

13) A box contains 5 red balls, 4 blue balls, and 3 green balls. A ball is randomly selected, noted, and then returned to the box. The process is repeated. a) Create a probability tree diagram for this experiment. b) Calculate the probability of selecting a red ball on the first draw followed by a blue ball on the second draw. (5 marks) Question 14:

Answer: _____

14) A box contains 5 yellow balls and 3 blue balls. A ball is taken out and replaced three times. Calculate the probability that the first two balls drawn are yellow and the third ball drawn is blue. (4 marks) Question 15:

Answer: _____

15) In a bag there are 3 red balls, 2 black balls, and 4 white balls. A ball is randomly selected, noted, and then returned to the bag. This process is repeated three times. a) Create a probability tree diagram for this experiment. b) Calculate the probability of selecting a red ball on the first draw, a black ball on the second draw, and a white ball on the third draw. (5 marks) Mark Scheme: Question 1: - Correctly solving the simultaneous equations: 2 marks - Providing the correct values for x and y: 2 marks Question 2: - Properly shading the region that represents the solution set: 2 marks Question 3: - Setting up the trigonometric equation correctly: 1 mark - Applying trigonometric ratios to find the required distance: 2 marks - Providing the distance between P and Q, correct to two decimal places: 1 mark Question 4: - Setting up the equation $\sin(x) = \cos(x)$: 1 mark - Solving the equation correctly: 2 marks Question 5: - Applying trigonometric ratios to find the required length: 2 marks - Providing the length of BC, correct to two decimal places: 1 mark Question 6: - Correctly calculating the number of boys in the class using the given ratio: 2 marks Question 7: - Calculating the increase in speed: 1 mark - Adding the increase to the initial speed: 1 mark - Providing the final speed of the car: 1 mark Question 8: - Calculating the total population using the given population density and area: 2 marks Question 9: - Setting up the equations based on the given information: 1 mark - Solving the equations correctly to find the length and width: 2 marks - Providing the length and width of the rectangle: 1 mark Question 10: - Correctly determining the relationship between angles in the circle: 1 mark - Applying the circle theorem to find the value of angle x: 2 marks Question 11: - Calculating the probability of selecting a blue ball on the first draw and a green ball on the second draw: 3 marks Question 12: - Calculating the probability of selecting a blue ball on the first draw and a green ball on the second draw: 1 mark - Explaining that the balls were removed: 1 mark - Multiplying the probabilities correctly: 2 marks Question 13: a) - Correctly creating the probability tree diagram with appropriate branches and probabilities: 3 marks b) - Calculating the probability of selecting a red ball on the first draw and a blue ball on the second draw: 2 marks Question 14: - Calculating the probability of selecting two yellow balls on the first two draws and a blue ball on the third draw: 4 marks Question 15: a) - Correctly creating the probability tree diagram with appropriate branches and probabilities: 3 marks b) - Calculating the probability of selecting a red ball on the first draw, a black ball on the second draw, and a white ball on the third draw: 2 marks

Answer: _____