**Course Specialist Year 11**

Student name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Teacher name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Date: 18 Sep 2020

**Task type: Response**

**Time allowed for this task: \_\_\_\_\_45\_\_\_\_\_\_ mins**

**Number of questions: \_\_\_\_\_6\_\_\_\_\_\_**

**Materials required:** Calculator-Free

Standard items: Pens (blue/black preferred), pencils (including coloured), sharpener, correction fluid/tape, eraser, ruler, highlighters

Special items: Drawing instruments, templates

**Marks available: \_\_45\_\_\_\_ marks**

**Task weighting: \_\_10\_\_%**

**Formula sheet provided: Yes**

**Note: All part questions worth more than 2 marks require working to obtain full marks.**

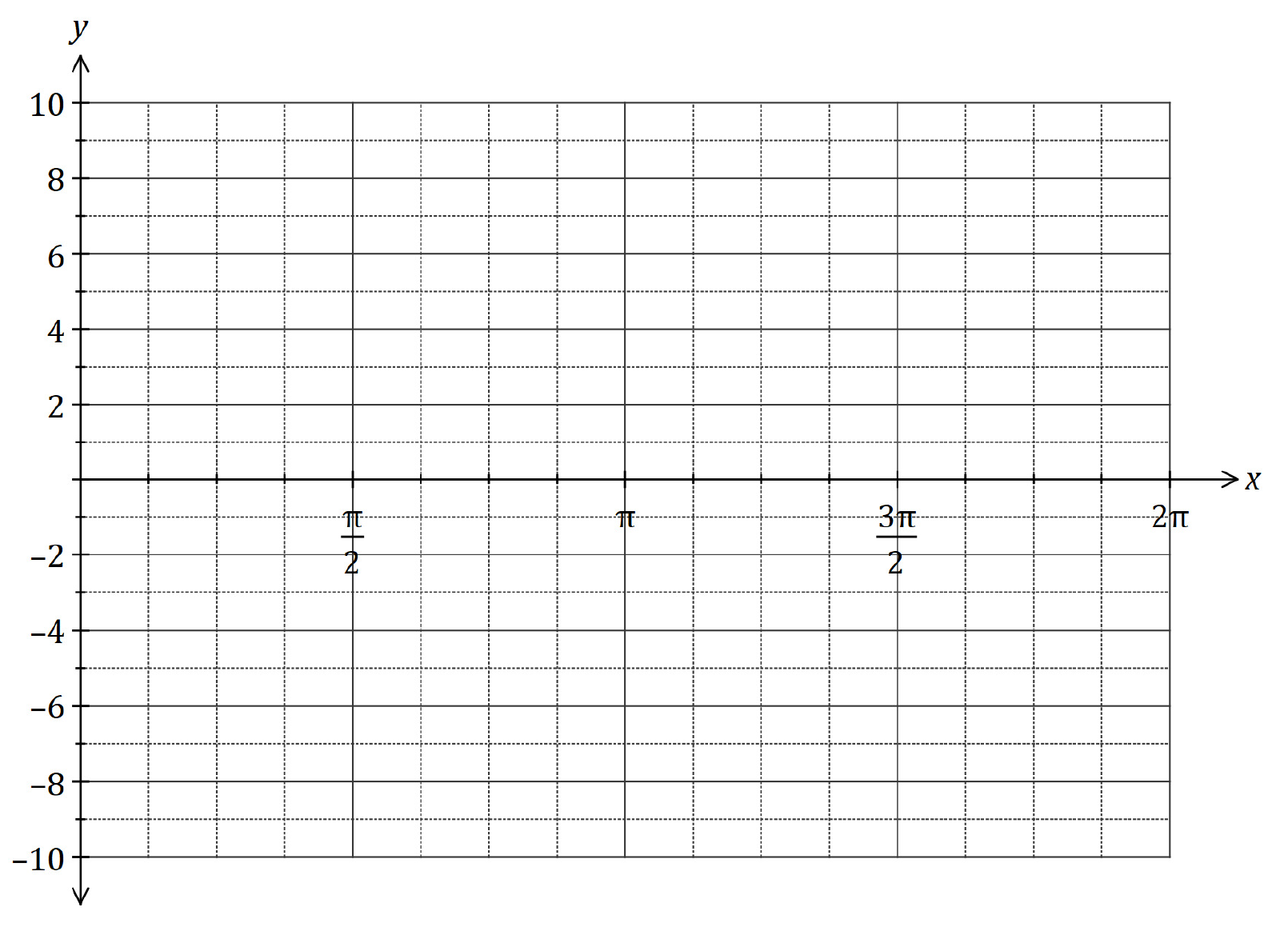
**Question 1 (2.2.1, 2.2.2, 2.2.3) (6 marks)**

If , O is the zero matrix and I is the identity matrix, find

1. Matrix B given that (1 mark)
2. Matrix C given that (1 mark)
3. Matrix D given that (4 marks)

**Question 2 (2.1.4, 2.1.7) (7 marks)**

1. On the axes below, sketch the graph of . (3 marks)



1. Find the general solution for . (4 marks)

**Question 3 (2.2.3, 2.1.3) (6 marks)**

Let and , such that .

Find and for .

**Question 4 (2.1.3, 2.1.5) (6 marks)**

Prove the following identity:

**Question 5 (2.2.11) (9 marks)**

If and

1. Determine AB. (2 marks)
2. Express in terms of B. (3 marks)
3. Solve the system , clearly showing your use of . (4 marks)

**Question 6 (2.2.4, 2.2.5, 2.2.6, 2.2.7, 2.2.8, 2.2.9, 2.2.10) (11 marks)**

1. Determine the matrices that produce each of the transformations described below:
2. a rotation clockwise about the origin by (1 mark)
3. a dilation parallel to the y-axis by a scale factor of 2 (1 mark)
4. a reflection in the line (1 mark)
5. Show how to obtain the single transformation matrix T, given that T is the result of applying the transformations given in part a) in the order listed [i.e. a rotation clockwise about the origin by 90°, followed by a dilation parallel to the y-axis by a scale factor of 2, then a reflection in the line ]. (2 marks)
6. is translated left by 1 unit and down by 2 units, then the transformation matrix T in part b) is applied to it. The final image is shown below:

A picture containing screen

Description automatically generated

1. Determine the coordinates of points A, B and C in exact form. (4 marks)
2. Determine the exact area of . (2 marks)