**West Coast Collaborative**

**Specialist Mathematics Units 3 & 4**

**Test 2 2018**

**Functions & Sketching Graphs**

**Task weighting: 7%**

**Calculator Free Section**

**Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Score: \_\_\_\_\_ / 22**

**Time Allowed**: 22 minutes, under test conditions

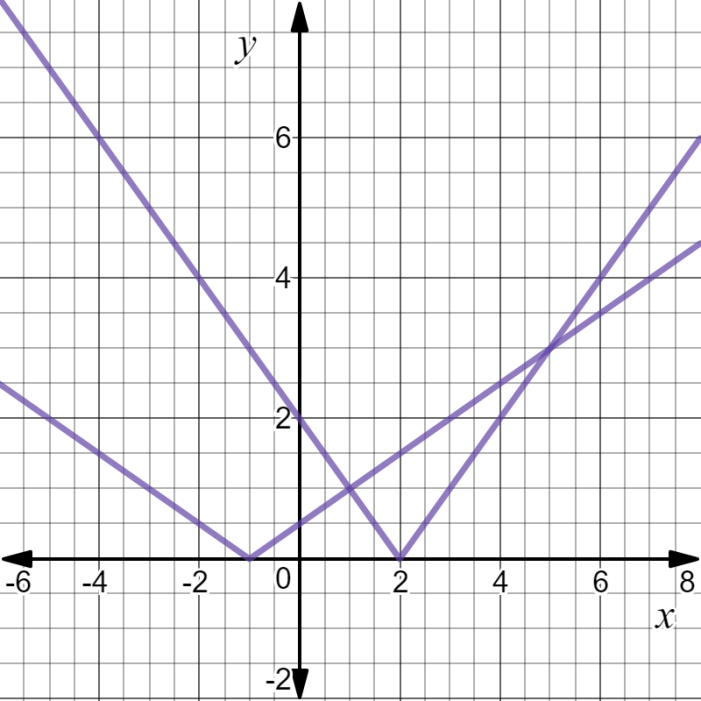
**Materials Allowed**: SCSA formula booklet

**Materials required:** Standard items: Pens (blue/black preferred), pencil, sharpener, correction fluid/tape,

eraser, ruler, highlighters.

**Instructions:** Where a question or part of a question is worth more than 2 marks sufficient working to justify your solution is required. Simplify answers where possible.

**Question 1. (3 marks)**

Use the diagram opposite to assist you to solve:

**Question 2. (4 marks)**

Consider the nature of the graph of . Describe the effect on the y values of the

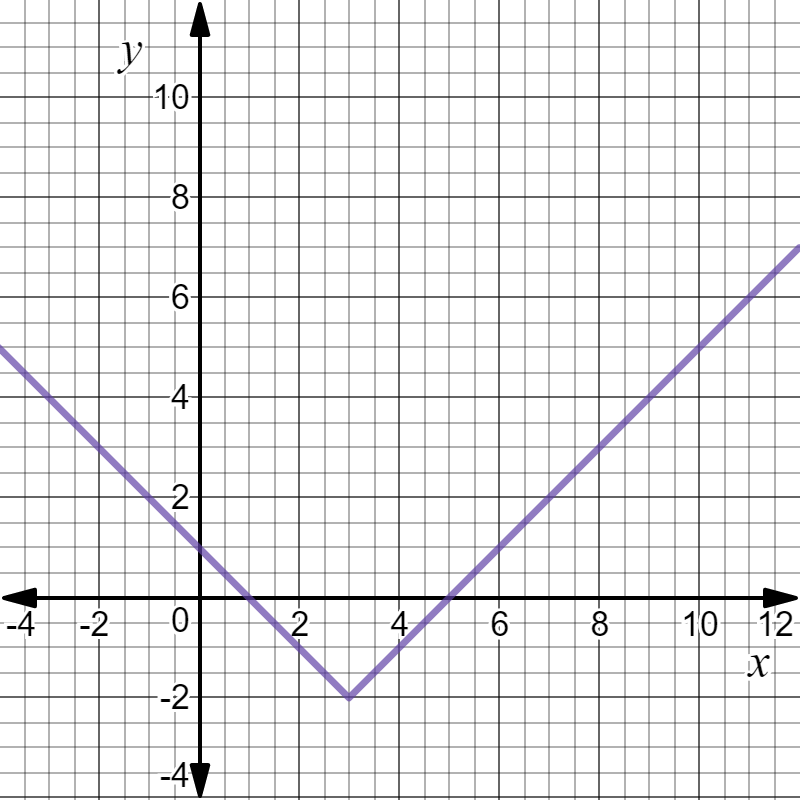
graph as

1. x tends to
2. x tends to
3. x tends to
4. x tends to

**Question 3. (3 marks)**

The graph of is shown below. Find and equation

is .



**Question 4. (4 marks)**

If determine

1. (2)

1. The value(s) of x such that . (2)

**Question 5. (4 marks)**

If and find the natural domain and corresponding range for

1. fog(x) (2)

1. gof(x) (2)

**Question 6. (4 marks)**

Find an expression for the inverse function of where and state the domain and range of .

**End of Section One**

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You may use this space to extend your working on a particular question or questions. Remember to number each extension.

**West Coast Collaborative**

**Specialist Mathematics Units 3 & 4**

**Test 2 2018**

**Functions & Sketching Graphs**

**Task weighting: 7%**

**Calculator Assumed Section**

**Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Score: \_\_\_\_\_ / 33**

**Time Allowed**: 33 minutes, under test conditions

**Materials Allowed**: SCSA formula booklet, Calculators and 1 page of A4 notes, written on both sides

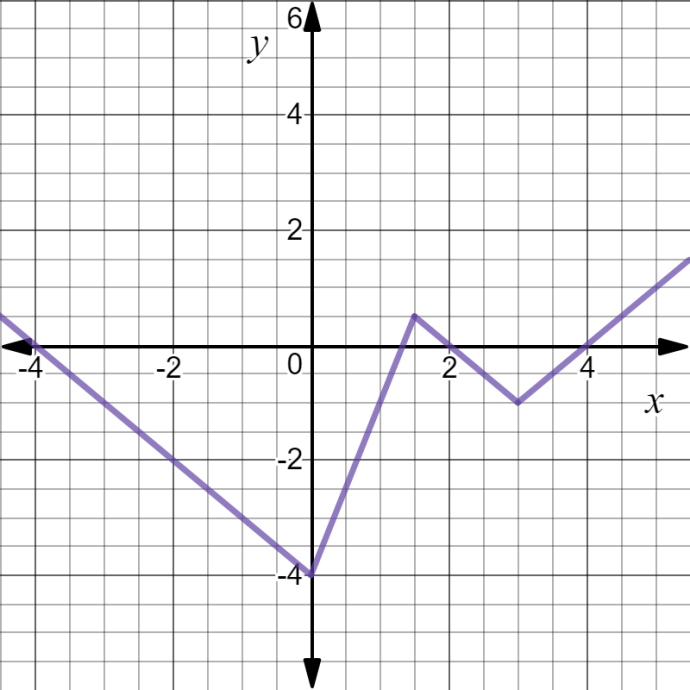
**Materials required:** Standard items: Pens (blue/black preferred), pencil, sharpener, correction fluid/tape,

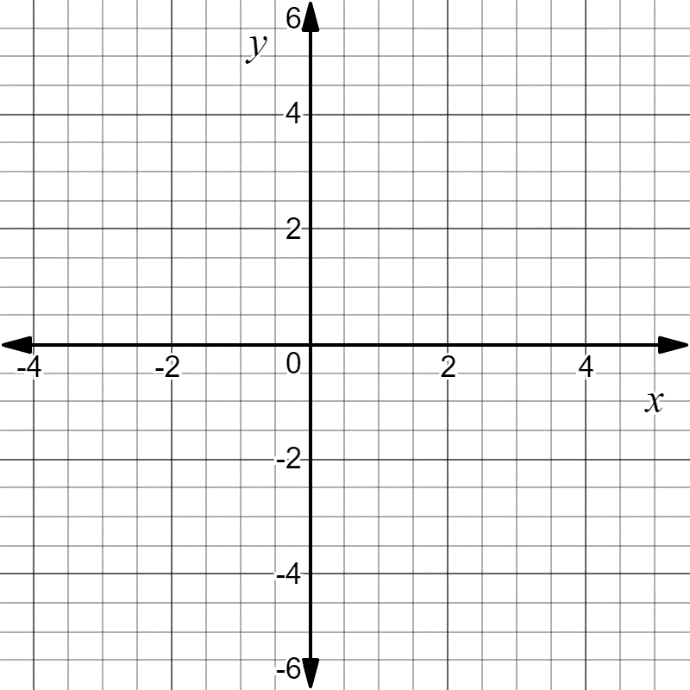
eraser, ruler, highlighters.

**Instructions:** Where a question or part of a question is worth more than 2 marks sufficient working to justify your solution is required. Simplify answers where possible.

**Question 7. (4 marks)**

The graph of is shown below in diagram (a). Show the graph of in diagram (b).

(a) (b)



**Question 8. (3 marks)**

Find an expression for the inverse function of where and state its

domain and range.

**Question 9. (4 marks)**

Consider the graph of

1. Locate any asymptotes. (2)

1. Describe any other discontinuities. (2)

**Question 10*.* (6 marks)**

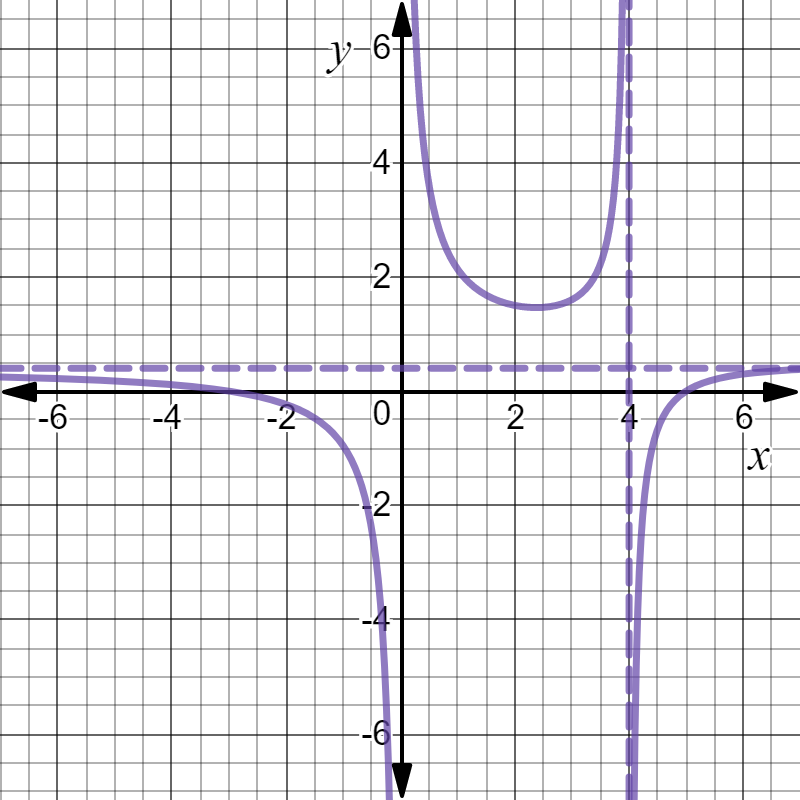
Determine all of the asymptotes for each of the following functions:

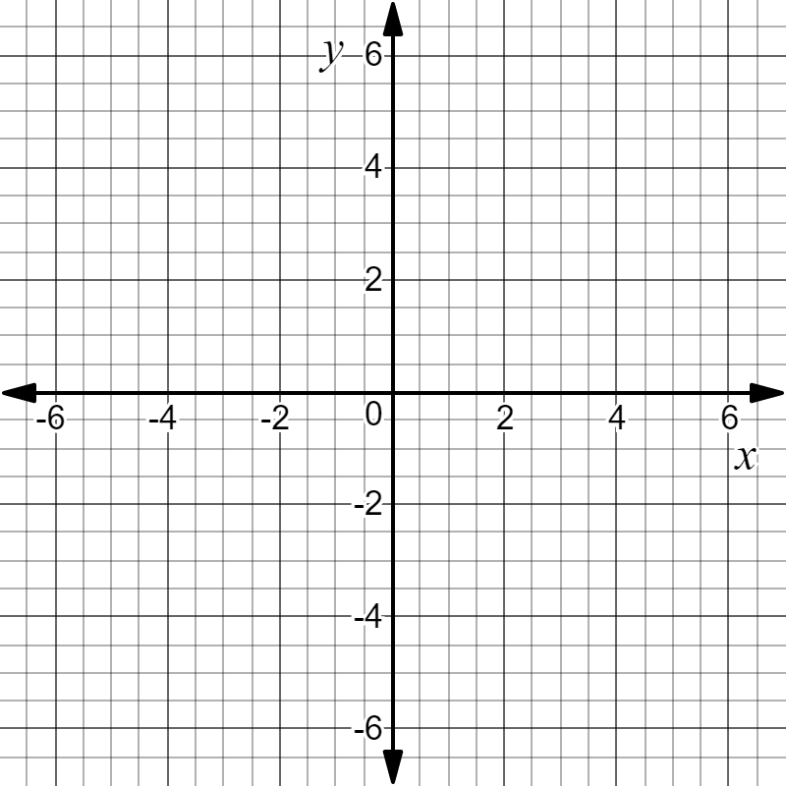
1. F(x) = (2)
2. G(x) = (2)

1. H(x) = (2)

**Question 11. (5 marks)**

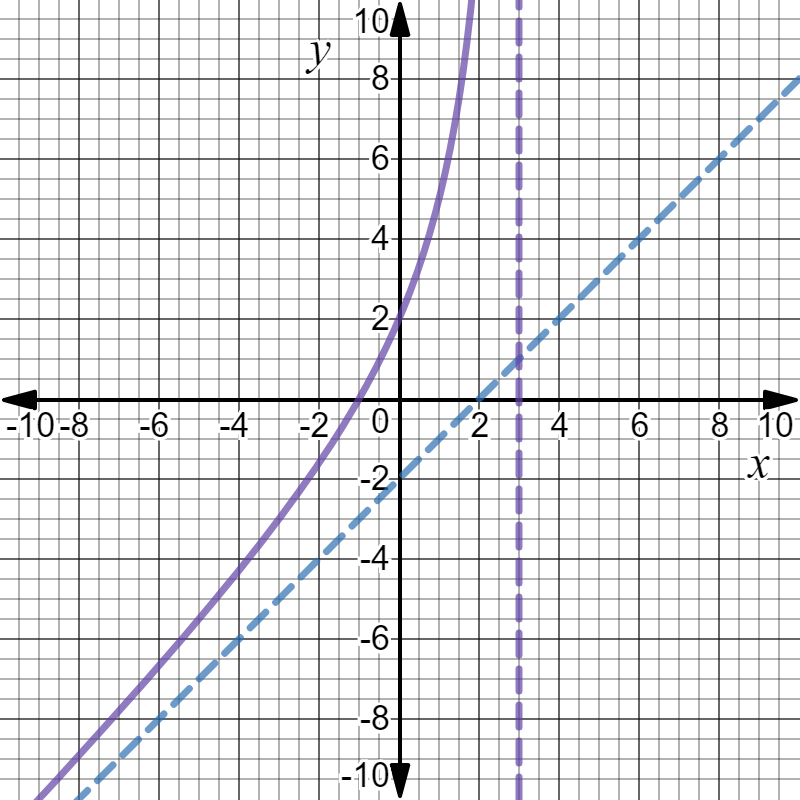
The graph of is shown below. It has asymptotes at . On the next set of axes draw the graph of , clearly showing any roots and asymptotes.





**Question 12. (7 marks)**

The graph of , has asymptotes as is shown below:



1. Explain why has an inverse function and find . (2)
2. Sketch the graph of on the same set of axes above. Include any

asymptotes in your sketch. (3)

1. Solve for . (2)

**Question 13. (4 marks)**

Given that and state the natural domain and the corresponding

range of each of the following functions:

1. (2)
2. (2)

**End of Test Paper**

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You may use this space to extend your working on a particular question or questions. Remember to number each extension.