

**Year 11 Specialist
Test 4 – Part B 2019**

Calculator Free
Trigonometry

STUDENT'S NAME _____

DATE: Monday 5th August

TIME: 20 minutes

MARKS: 16

INSTRUCTIONS:

Standard Items: Pens, pencils, drawing templates, eraser and scientific calculator

1. (3 marks)

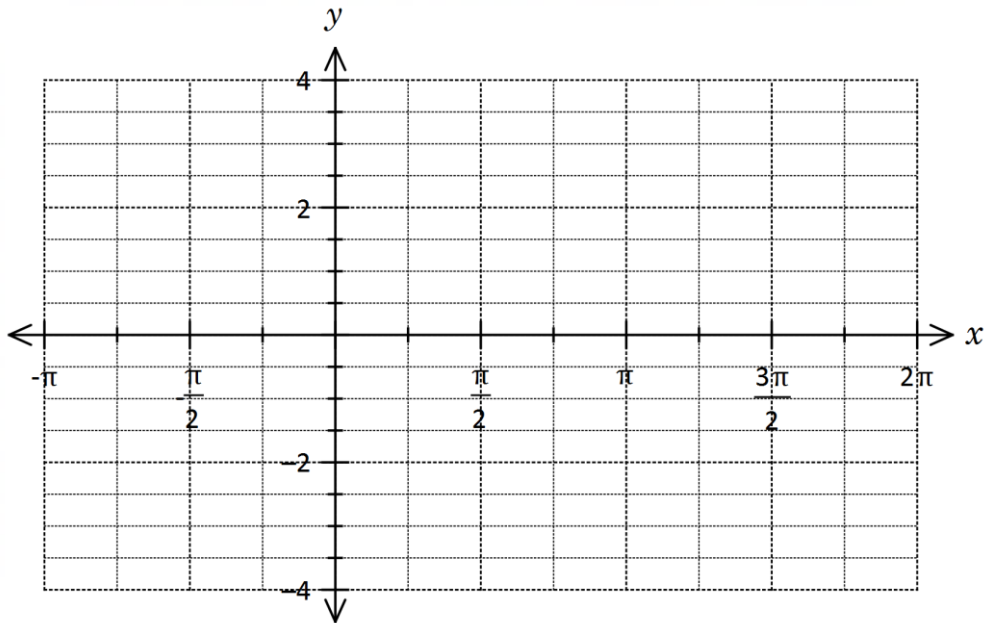
Find the exact value of all solutions to the equation: $\sin x = \frac{\sqrt{3}}{2}$

2. (4 marks)

Sketch the following trigonometric functions on the axes below, including any asymptotes.

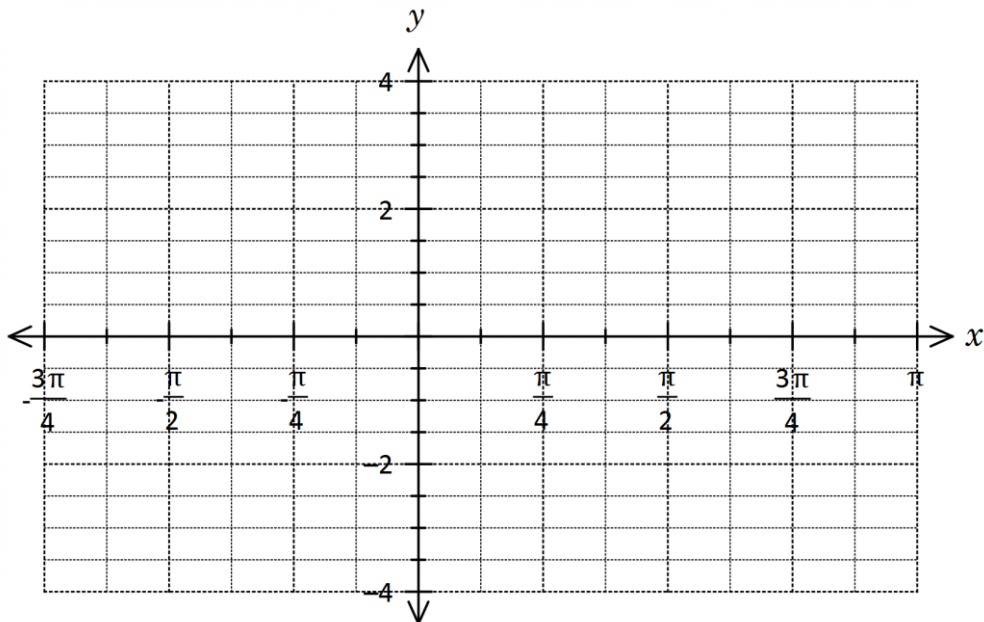
(a) $y = 2\sin\left(x - \frac{\pi}{4}\right)$

[2]



(b) $y = \sec(2x) - 3$

[2]

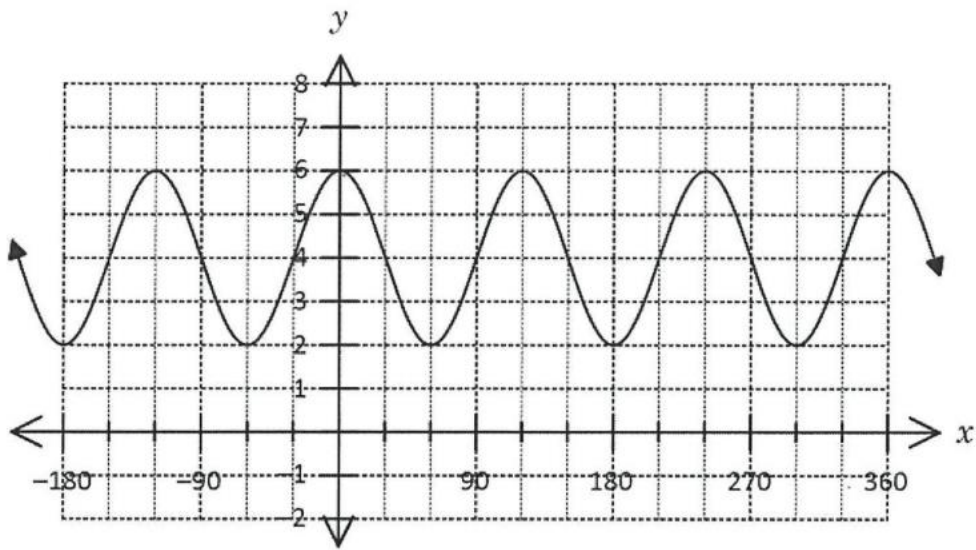


3. (4 marks)

Determine the equation for each of the following trigonometric functions.

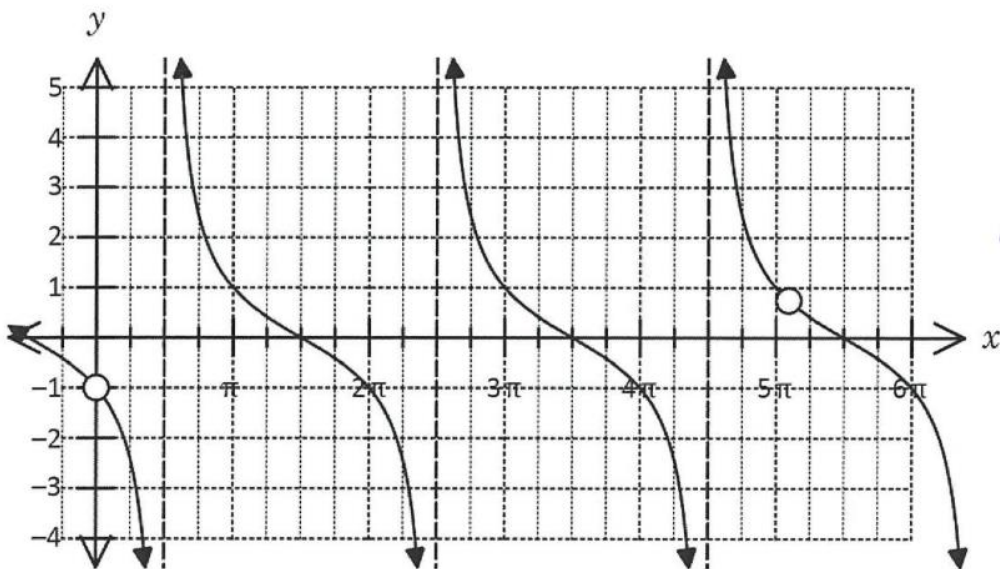
(a)

[2]



(b)

[2]



4. (5 marks)

Solve: $\cos 5x \sin 3x - \sin 4x \cos 4x = \frac{1}{2} \sin x$ for $-\pi \leq x \leq \pi$

**Year 11 Specialist
Test 4 – Part B 2019**

Calculator Allowed
Trigonometry

STUDENT'S NAME _____

DATE: Monday 5th August

TIME: 10 minutes

MARKS: 8

INSTRUCTIONS:

Standard Items: Pens, pencils, drawing templates, eraser and calculator

5. (8 marks)

The height of the tide above mean sea level at a certain port can be modelled by the equation $h(t) = 4\sin\left(\frac{\pi t}{6} - \frac{\pi}{2}\right)$ where t is the number of hours after 9pm on a day.

- (a) When is the first high tide? [2]
- (b) What is the range of tides at this port? [1]
- (c) What was the height of the tide at noon the following day? Was it going out or coming in at this time? [2]
- (d) Safety regulations state that a ship can only enter the port when there is a clearance of 3m of water above the low tide. What is the earliest time that a ship could safely enter or leave the port? [3]