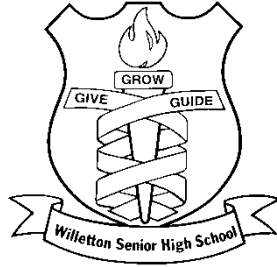# WILLETTON SENIOR HIGH SCHOOL

YEAR 11
MATHEMATICS METHODS
TEST 1 – CALCULATOR FREE
2024

STUDENT'S NAME: _____

CIRCLE YOUR TEACHER'S NAME:

Mr Galbraith	**Mrs Gatland**	**Mrs Kalotay**	**Mr Lee**
Mr Riemer	**Mrs Scoles**	**Mrs Smirke**	**Mrs Thompson**

Working Time: 25 minutes

Calculators are not permitted

Marks: _____/30

Question 1 **(2 marks)**

    a) Convert $\frac{11\pi}{6}$ to degrees.   [1]

    b) Convert $240°$ to radians.   [1]

Question 2 **(3 marks)**

Find the exact value of;

    a) $\sin 150°$.   [1]

    b) $\cos \frac{5\pi}{4}$.   [1]

    c) $\tan(-60°)$.   [1]

Question 3   **(3 marks)**

If $\sin 134° = 0.72$ and $\sin 136° = 0.69$,   state the value of;

    a) $\sin(-46°)$.   [1]

    b) $\sin(316°)$.   [1]

    c) $\sin(404°)$.   [1]

Question 4   **(2 marks)**

Determine all possible solutions for the following equation over the given domain;

$$\cos \theta = \frac{-1}{2} \quad , \quad -180° \leq \theta \leq 180°$$

Question 5 (2 marks)

Evaluate $\binom{12}{4}$.

Question 6 (7 marks)

a) Find the fourth term in the expansion of $(5 - 2x)^4$ if the terms are written in ascending powers of x. [2]

b) Find the coefficient of x^4 in the expansion of $(3x - 2)^5$. [2]

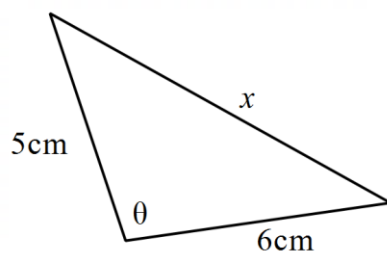c) Find the constant term (term independent of x) in the expansion of $(2x^2 - \frac{1}{x})^3$. [3]

Question 7   **(3 marks)**

Find the angle of inclination for the line $x + \sqrt{3}y + 4 = 0$.
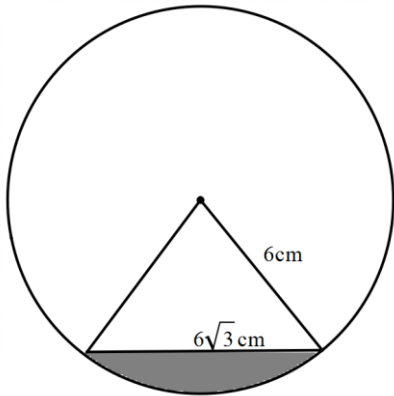
Question 8   **(4 marks)**

  a) Determine the value of θ, given $\sin\theta = \dfrac{\sqrt{3}}{2}$, and θ is obtuse.   [1]

  b) Determine the exact value of x, using your value of θ from above.   [3]

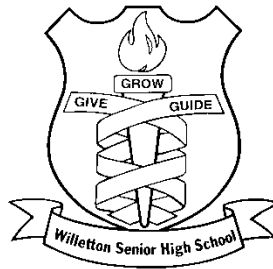**Question 9** **(4 marks)**

Find the exact area of the shaded segment below;

WILLETTON SENIOR HIGH SCHOOL

YEAR 11
MATHEMATICS   METHODS
TEST 1 – CALCULATOR ALLOWED
2024

STUDENT'S NAME: _____

CIRCLE YOUR TEACHER'S NAME:

Mr Galbraith	**Mrs Gatland**	**Mrs Kalotay**	**Mr Lee**
Mr Riemer	**Mrs Scoles**	**Mrs Smirke**	**Mrs Thompson**

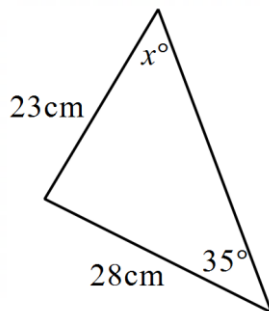**Working Time:**   **25 minutes**

Calculators and/or Classpads are permitted.
One page of notes, one side only.

Marks: _____/ 22

Question 10 **(3 marks)**

Determine the value of x in the diagram below.

Question 11 **(7 marks)**

Cynthia decides to have a get together for some friends at her new house. She has 12 close friends, but only room for eight friends around her new dining table. Of her close friends, four of them are friends of hers from high school.

In how many ways may she choose the eight guests from her twelve friends if;
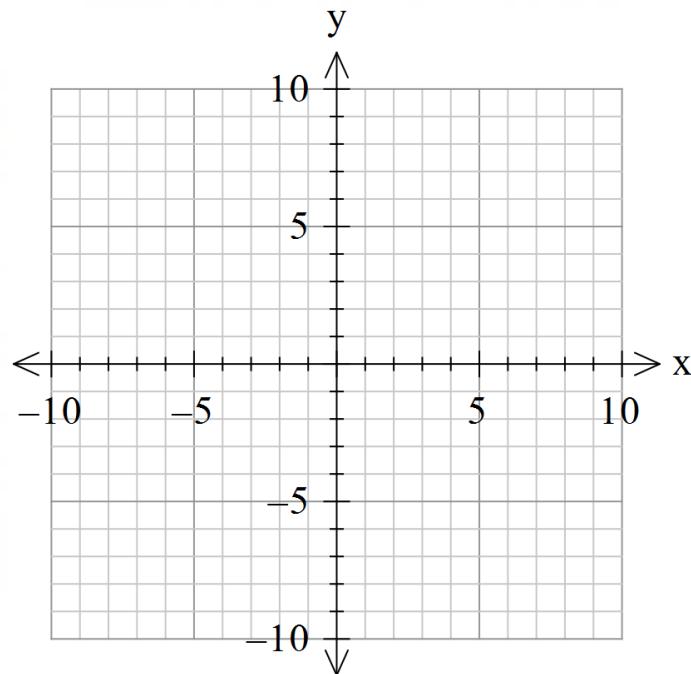
    a) there are no restrictions. [1]

    b) at most two friends from high school may be chosen. [3]

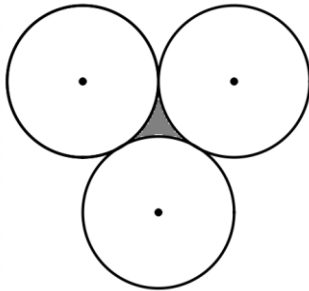   c) If her friend Julie and her friend Blake will not attend together. [3]

Question 12 **(6 marks)**

By graphing each of the following, find the size of the obtuse angle in degrees between them where $y = -2x + 6$ and $3y - 4x = 12$.

Question 13 **(6 marks)**

Three circles each of radius 10 cm touch each other externally.

Determine;

   a) the perimeter of the shaded area as an exact value.   [2]

   b) the shaded enclosed area between them as an exact value.   [4]

END OF CALCULATOR ASSUMED