Centre Number

Student Number

CSSA

CATHOLIC SECONDARY SCHOOLS
ASSOCIATION OF NEW SOUTH WALES

2012
TRIAL HIGHER SCHOOL CERTIFICATE EXAMINATION

General Mathematics

Morning Session
Monday, 6 August 2012

General Instructions

- Reading time – 5 minutes
- Working time – 2½ hours
- Write using blue or black pen
  Black pen is preferred
- Calculators may be used
- Use Multiple Choice Answer Sheet provided
- A separate Formula Sheet is provided
- Write your Centre Number and Student Number at the top of this page

Total marks: 100

Section I Pages 2–11

25 marks
- Attempt Questions 1–25
- Allow about 35 minutes for this section

Section II Pages 12–24

75 marks
- Attempt Questions 26–30
- Allow about 1 hour and 55 minutes for this section

Section I

25 marks
Attempt Questions 1–25
Allow about 35 minutes for this section

Use the multiple-choice answer sheet for Questions 1–25.

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1 David selects a letter at random from the word **BANANA**.

What is the probability that he chooses a letter **N**?

(A) $\frac{1}{6}$

(B) $\frac{1}{3}$

(C) $\frac{1}{2}$

(D) $\frac{2}{3}$

2 Consider the formula $t = 3y^2 - 8$.

Given $y = -1.8$, what is the value of t?

(A) -17.72

(B) -13.4

(C) 1.72

(D) 21.16

3 Which of the following is most important when designing an effective questionnaire?

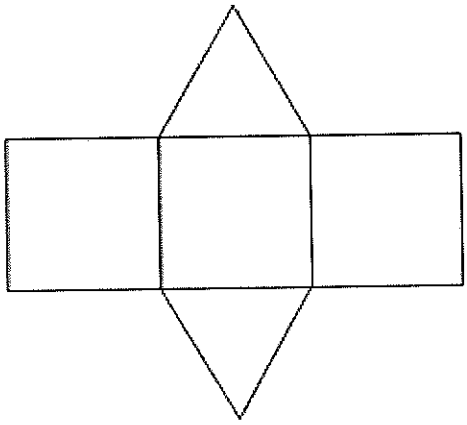
(A) Freedom from bias

(B) The cost of postage

(C) The number of questions

(D) Your favourite colour

4



Which of the following best describes the solid that can be formed from the net above?

(A) Square prism

(B) Square based pyramid

(C) Triangular prism

(D) Triangular pyramid

5 The area of an ellipse is 32π cm^2. The length of the semi-minor axis is 2 cm.

What is the length of the semi-major axis?

(A) 2 cm

(B) 4 cm

(C) 8 cm

(D) 16 cm

6 What type of data is best displayed as a line graph?

(A) Categorical

(B) Continuous

(C) Random

(D) Systematic

7 Rashi bought 420 shares in Aztec Gold with a market value of $11.70 per share. Brokerage fees were 1.5% of the purchase price.

What was the total cost of buying the shares?

(A) $4176.90

(B) $4914.00

(C) $4987.71

(D) $5651.10

8 The positions of Captain and Vice-Captain of a club are to be chosen from a committee of 10 people.

In how many ways can the two positions be chosen?

(A) 2

(B) 20

(C) 45

(D) 90

9 A restaurant buys an industrial dishwasher for $8235. Each year it is worth 12% less than the year before.

Which term best describes this type of depreciation?

(A) Declining balance depreciation

(B) Linear depreciation

(C) Salvage value

(D) Straight line depreciation

10 Having a vaccination reduces the likelihood of developing an illness.

Which of the following best describes this relationship?

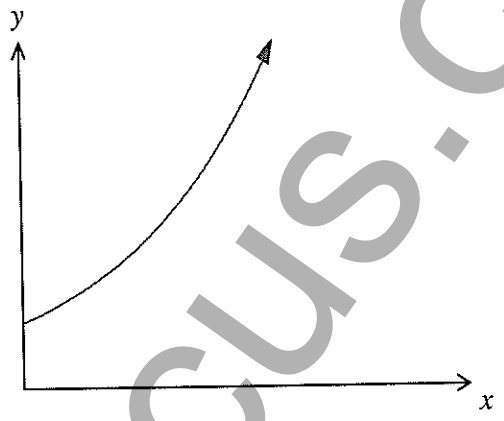
(A) Negative correlation

(B) No correlation

(C) Positive correlation

(D) Scatter plot

11 Which equation best represents the graph drawn below?



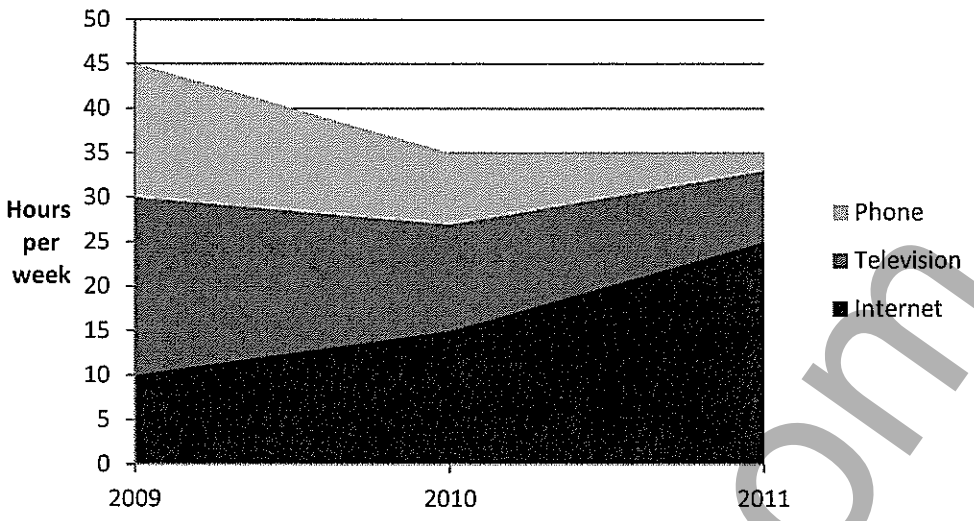
(A) $y = 4x$

(B) $y = 4x^3$

(C) $y = 4^x$

(D) $y = \frac{4}{x}$

12



The area chart shows the average number of hours per week spent by Year 12 students talking on the phone, watching television and on the internet.

Which of the following statements is NOT correct?

(A) On average, eight hours per week were spent on the phone in 2010.

(B) The average number of hours per week spent on the internet increased between 2009 and 2011.

(C) There was a decrease in the average number of hours per week spent on television between 2010 and 2011.

(D) There was no change in the average number of hours per week spent on the phone between 2010 and 2011.

13 Perth is located at 32°S, 115°E and Jakarta is located at 6°S, 106°E.

If it is 4.15 pm in Perth, what would the time be in Jakarta? (Ignore time zones)

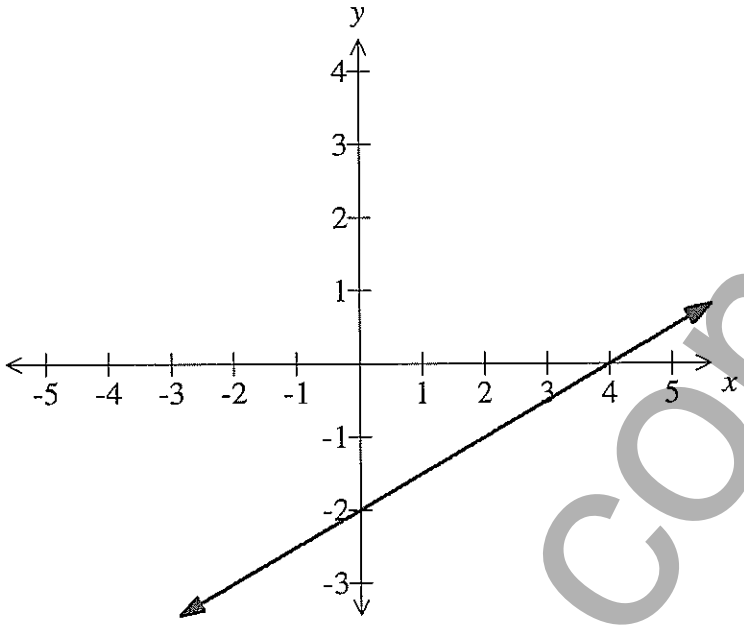
(A) 3.39 pm

(B) 4.06 pm

(C) 4.24 pm

(D) 4.51 pm

14



What is the equation of this line?

(A) $y=\frac{1}{2}x+4$

(B) $y=\frac{1}{2}x-2$

(C) $y=2x+4$

(D) $y=2x-2$

15 Joe earns \$81 752 p.a. working as an accountant in the city. He also earns \$680 a year in interest from the bank.

He has allowable deductions of \$380 in professional fees each year, \$5200 in work expenses each year and \$50 per week in travel expenses.

What is Joe's taxable income?

(A) \$72 892

(B) \$74 252

(C) \$75 442

(D) \$76 802

16 Julia used her car to travel 300 km. She used 48 litres of petrol on this trip.

Consider the following statements:

Statement 1: Julia's fuel consumption was 6.25 km/L.
Statement 2: Julia's fuel consumption was 16 L/100 km.

Which of the above statements are true?

(A) 1 only

(B) 2 only

(C) Both 1 and 2

(D) Neither 1 nor 2

17 Michael Clarke has scored 5909 runs in 145 test cricket innings.

How many runs does he need to score in his next innings to take the mean number of runs scored per innings to 42?

(A) 181

(B) 223

(C) 6090

(D) 6132

18 What is the solution of the equation $4x - 5 = \frac{x+1}{2}$?

(A) $x = -\frac{9}{7}$

(B) $x = -\frac{4}{7}$

(C) $x = \frac{6}{7}$

(D) $x = \frac{11}{7}$

19 Giorgio wants to take out a loan from Pythag Bank to buy a car. He knows that he can afford to repay $450 per month over 4 years. The interest rate is 10% p.a. compounded monthly.

How much can Giorgio afford to borrow?

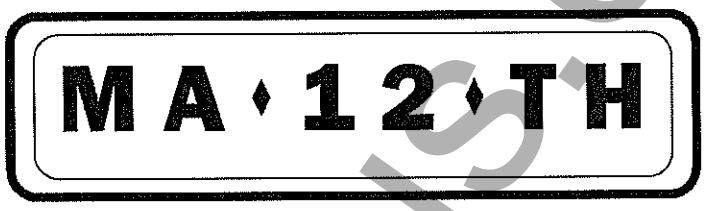
(A) $1426.44

(B) $15 329.27

(C) $17 742.67

(D) $26 425.12

20 New car registration plates contain two letters followed by two numerals followed by two more letters as shown in the example below. Letters and numerals may be repeated.



Which of the following expressions gives the number of car registration plates that start and finish with the SAME letter?

(A) $25^2 \times 10^2$

(B) $26^2 \times 10^2$

(C) $25^3 \times 10^2$

(D) $26^3 \times 10^2$

21 The coordinates of Zurich are 47°N, 9°E.

What are the approximate coordinates of a city which is 2222 km due south of Zurich? (1 nautical mile = 1.852 km)

(A) 10°N, 9°E

(B) 27°N, 9°E

(C) 67°N, 9°E

(D) 84°N, 9°E

22 In a normal distribution, approximately what percentage of scores will have a z-score between – 2 and 1?

(A) 48.5%

(B) 68%

(C) 81.5%

(D) 95%

23 The formula for the volume of a cone with radius r and perpendicular height h is given by

$$V = \frac{1}{3}\pi r^2 h .$$

Which of the following correctly expresses r as the subject of this formula?

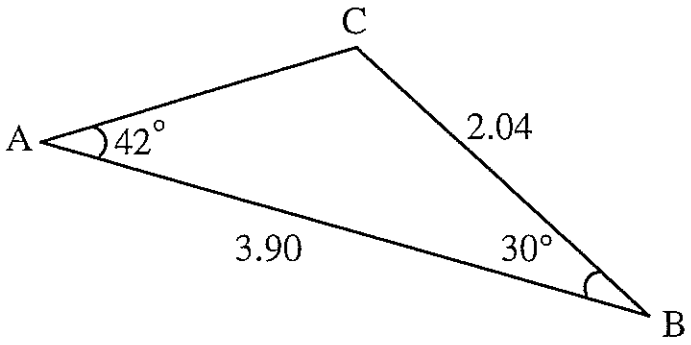
(A) $r = \sqrt{\dfrac{3V}{\pi h}}$

(B) $r = \dfrac{\sqrt{3V}}{\pi h}$

(C) $r = \sqrt{\dfrac{Vh}{3\pi}}$

(D) $r = \sqrt{\dfrac{\pi h}{3V}}$

24



NOT TO SCALE

For the triangle above, which equation is correct?

(A) $\sin 42° = \dfrac{2.04 \times \sin 108°}{3.90}$

(B) $\sin 30° = \dfrac{2.04 \times \sin 108°}{3.90}$

(C) $\sin 42° = \dfrac{3.90 \times \sin 108°}{2.04}$

(D) $\cos 30° = \dfrac{2.04}{3.90}$

25 The effective simple interest rate, E, per period (expressed as a decimal) charged on a loan in relation to the stated interest rate, r, per period (expressed as a decimal) is found using:

$$E = \frac{(1+r)^n - 1}{n}$$ where n is the number of periods

Hannah is looking to invest money in an account with a stated interest rate of 9% p.a. compounded monthly for 5 years.

What is the equivalent effective simple interest rate, per annum?

(A) 0.9%

(B) 2.9%

(C) 10.8%

(D) 11.3%