Canberra Institute of Technology
RTO Code 0101 | CRICOS No. 00001K

ACT Senior Secondary Certificate
Skills Evaluation: Mathematics

Time allowed: 45 minutes
Number of questions: 23

Instructions

This skills evaluation includes questions from different levels of Mathematics.

The last six questions are particularly relevant for students wanting to study Mathematical Methods.

Do not worry if you can't answer all the questions.

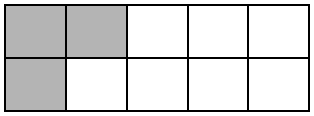
Do not use a calculator. Write your answers on the answer sheet provided**.**

Do <u>not</u> write in this booklet.

If you have any questions, please contact the CIT Year 12 Office:
year12@cit.edu.au | (02) 6207 3412

Question 1

In the figure below, how many MORE squares need to be shaded so that $\frac{4}{5}$ of the small squares are shaded?



A. 1

B. 2

C. 3

D. 4

E. 5

Question 2

The length of a box is 9 cm *to the nearest centimetre*. Which one of the numbers below could be the actual length of the box?

A. 10 cm

B. 9.9 cm

C. 9.6 cm

D. 8.6 cm

E. 8.4 cm

Question 3

Alice can run 4 laps around a track in the same time that Carol can run 3 laps. When Carol has run 12 laps, how many laps has Alice run?

A. 9

B. 10

C. 12

D. 16

E. 20

Question 4

30% of Mark's weekly income goes towards paying his rent. If Mark's weekly income is $900, how much rent does he pay per week?

A. $270

B. $300

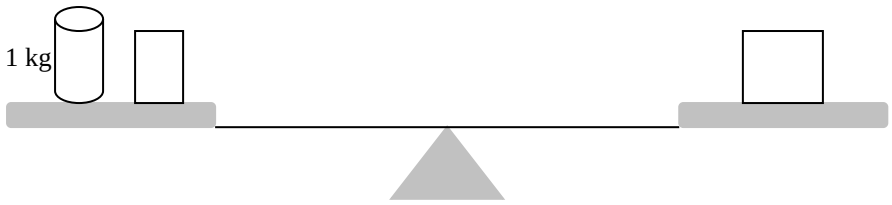
C. $330

D. $360

E. $390

Question 5

The objects on the scale make it balance exactly. On the left pan there is a 1 kg weight (mass) and half a brick. On the right pan there is one brick.



What is the weight (mass) of one brick?

A. 2.5 kg

B. 2 kg

C. 1.5 kg

D. 1 kg

E. 0.5 kg

Question 6

A thin wire 20 centimetres long is formed into a rectangle. If the width of this rectangle is 4 centimetres, what is its length?

A. 16 cm

B. 12 cm

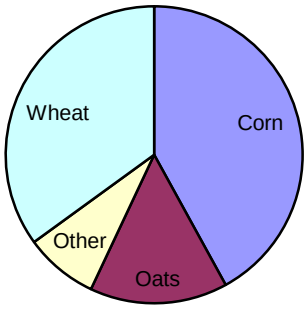
C. 6 cm

D. 5 cm

E. 8 cm

Question 7

The graph below shows the distribution of crop production in a certain country.



According to the information in the graph, which one of the following statements is true?

A. More oats are grown than wheat.

B. Corn is more than one-half of the country's crop.

C. Oats are more than one-third of the country's crop.

D. The total crop of oats and wheat is greater than the corn crop.

E. Rice is not grown in this country.

Question 8

Consider the three ordered pairs: (3, 6), (6, 15), (8, 21).
Which of the following rules describes how to get the second number from the first number in *all three* ordered pairs?

A. Add 3

B. Subtract 3

C. Multiply by 2

D. Multiply by 2 and then add 3

E. Multiply by 3 and then subtract 3

Question 9

Matchsticks are arranged as shown in the figures.

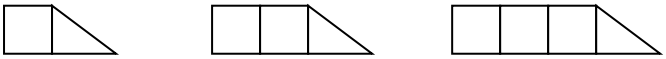


Figure 1 Figure 2 Figure 3

If the pattern is continued, how many matchsticks would be used to make Figure 10?

A. 3

B. 12

C. 15

D. 30

E. 33

Question 10

Which of the following is the LEAST amount of time?

A. $\frac{1}{10}$ of a day

B. 2.1 hours

C. 150 minutes

D. 2 hours and 10 minutes

E. 2 ¼ hours

Question 11

A scoop holds $\frac{1}{5}$ kg of flour. How many scoops of flour are needed to fill a bag with 6 kg of flour?

A. 35

B. 30

C. 11

D. 6

E. 5

Question 12

How many 250 millilitre bottles can be filled from a 400 litre tank of water?

A. 16

B. 40

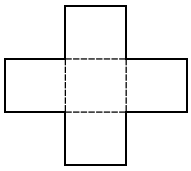
C. 160

D. 1600

E. 4000

Question 13

The figure below consists of 5 squares of equal area. The area of the whole figure is 180 cm^2.



What is the area of one square?

A. 16 cm^2

B. 25 cm^2

C. 36 cm^2

D. 40 cm^2

E. 45 cm^2

Question 14

For the figure in question 13, what is the length of one side of one square?

A. 4 cm

B. 6 cm

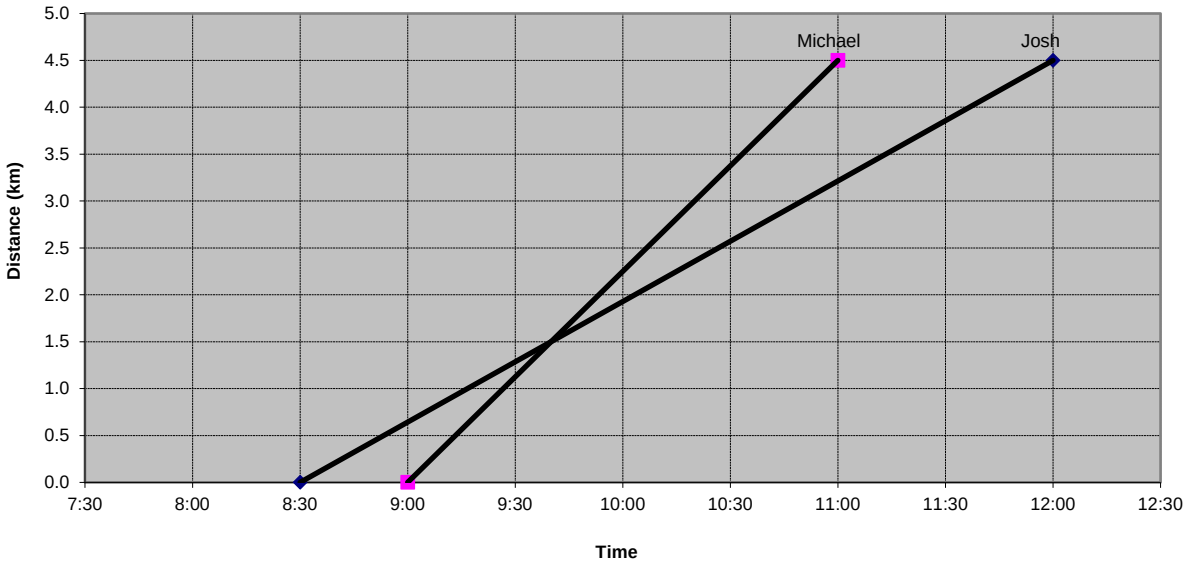
C. 8 cm

D. 9 cm

E. 18 cm

Question 15

Two brothers, Michael and Josh, decide to walk from their home to the local swimming pool. The graph represents the distance and time of their walks.



How far were Michael and Josh <u>from the pool</u> when they met?

A. 1.5 km

B. 2.0 km

C. 2.5 km

D. 3.0 km

E. 3.5 km

Question 16

If $4(x + 5) = 80$, then $x =$

A. 15

B. 10

C. 5

D. 20

E. 25

STOP HERE IF YOU ARE NOT INTENDING TO DO TERTIARY MATHS

Question 17

If n is a *negative* number, which of the following is the largest number?

A. $3 + n$

B. $3 \times n$

C. $3 - n$

D. $3 \div n$

F. $n - 3$

Question 18

Carla paid x dollars for 3 cartons of juice. What is the price in dollars of 1 carton of juice?

A. $\frac{x}{3}$

B. $\frac{3}{x}$

C. $3 + x$

D. $3x$

E. $x - 3$

Question 19

The expression $x^{\frac{a}{b}}$ is defined to mean $\left(\sqrt[b]{x}\right)^a$. For example $4^{\frac{3}{2}} = 8$. The expression $8^{\frac{5}{3}}$ is therefore equal to

A. 4

B. 16

C. 24

D. 32

E. 40

Question 20

The solution to the simultaneous equations $\begin{matrix} 2x+5y=14 \\ y=-8-4x \end{matrix}$ is

A. x = -3 and y = - 4

B. x = 3 and y = -20

C. x = 2 and y = 2

D. x= -2 and y = 0

E. x = -3 and y = 4

Question 21

Solve 3x+6 = 5, x =

A. $\frac{1}{3}$

B. $\frac{-1}{3}$

C. 3

D. -1

E. none of the options

Question 22

Factorise 3x+6

A. 9x

B. 9

C. 3(x+2)

D. 18x

E. none of the options

Question 23

Factorise $3x^2 - 6x$

A. $3(x^2-x)$

B. $3x^2(x-2)$

C. 3x(x-2)

D. -3x

E. none of the options