

**Question 1**

Jess bought 8 apples for \$6.80. What was the average price per apple?

\$

**Question 2**

The diagram shows the floor plan of a shed. What direction is the opening facing?



A SE

B S

C SW

D W

**Question 3**

If  $p = -5$ , what is the value of  $4p^2$ ?

A 100

B -100

C 400

D -400

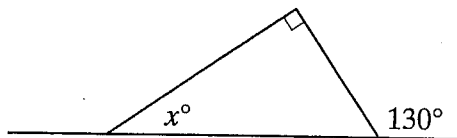
**Question 4**

Jett took 45 minutes to run from his home to the beach. His average speed was 12 kilometres per hour. How far is it from Jett's home to the beach?

km

**Question 5**

What is the value of  $x$ ?





# YEAR 9 NUMERACY SAMPLE TEST 1 – CALCULATOR ALLOWED

## Question 10

Which expression is equivalent to  $3(4a - 1)$ ?

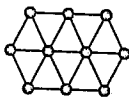
- A  $7a - 4$       B  $12a - 1$       C  $12a - 3$       D  $9a$

## Question 11

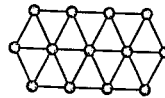
Carly is making this pattern with pins and string.



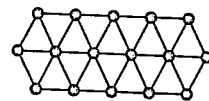
Shape 1



Shape 2



Shape 3



Shape 4

What number shape would need 40 pins?

- A 10      B 12      C 14      D 16

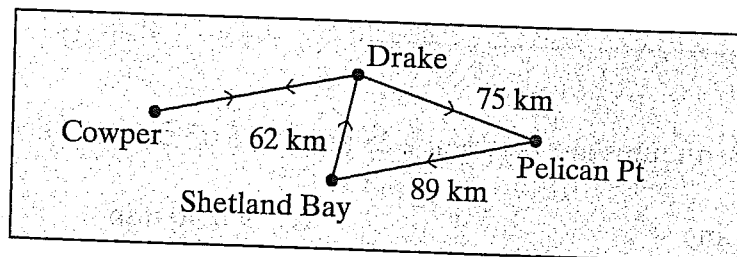
## Question 12

Which shape does **not necessarily** have two sides that are equal?

- A rhombus      B isosceles triangle  
C regular octagon      D trapezium

## Question 13

The diagram shows the route of a rally that starts and finishes at Cowper and covers a total of 320 km.



How far is it from Drake to Cowper?

 km

# YEAR 9 NUMERACY SAMPLE TEST 1 – CALCULATOR ALLOWED

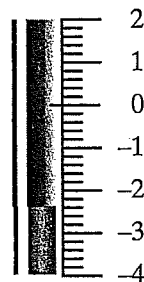
## Question 14

The average (mean) age of the male members of a choir is 13 and the average age of female members is 19. There are 20 males and 40 females in the choir. What is the average age of the members of the choir?

- A 15                      B 16                      C 17                      D 18

## Question 15

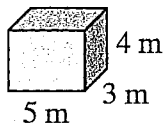
What temperature is shown on this thermometer?



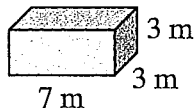
- A  $-2.2^{\circ}\text{C}$                       B  $-2.4^{\circ}\text{C}$                       C  $-3.4^{\circ}\text{C}$                       D  $-3.6^{\circ}\text{C}$

## Question 16

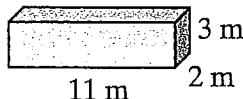
Which rectangular prism has the greatest volume?



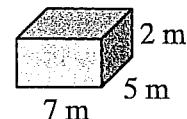
A



B



C



D

## Question 17

A polygon has four angles that each measure  $150^{\circ}$  and four other angles that are equal. What size is each of those remaining angles?



## Question 18

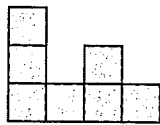
When two dice are thrown together, there are 36 possible outcomes. What is the probability that the two dice show a total of 8 when tossed together?

- A  $\frac{1}{36}$                       B  $\frac{1}{8}$                       C  $\frac{1}{6}$                       D  $\frac{5}{36}$

# YEAR 9 NUMERACY SAMPLE TEST 1 – CALCULATOR ALLOWED

## Question 19

Mel made a 3D object from identical cubes. She drew a front view and a side view.

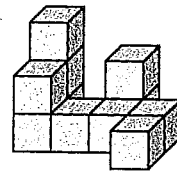
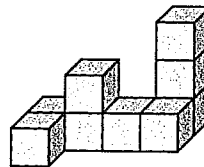
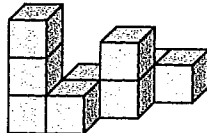
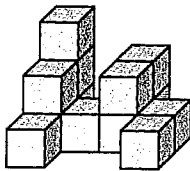


front view



side view

How many of the following could be Mel's object?



A one only

B exactly two

C exactly three

D all four

## Question 20

A photo was originally 12 cm long and 7.5 cm wide. It has been enlarged so that it is now 60 cm wide. How long is the enlarged photo?

cm

## Question 21

Consider this table of values:

$x$	1	1.5	2	3	6
$y$	6	4	3	2	1

Which is the correct rule for  $y$  in terms of  $x$ ?

A  $y = 6x$

B  $y = \frac{x}{6}$

C  $y = \frac{6}{x}$

D  $y = x + 6$

# YEAR 9 NUMERACY SAMPLE TEST 1 – CALCULATOR ALLOWED

## Question 22

Which is **not** a factor of 6789?

A 31

B 53

C 73

D 93

## Question 23

When two numbers are added together the result is  $-5$ . When the same two numbers are multiplied together the result is 6.

What are the two numbers?

and

## Question 24

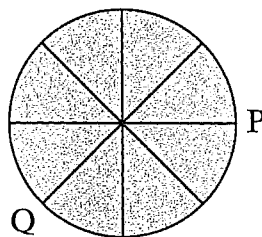
$$7a - 15 = 3a + 25$$

What is the value of  $a$  in this equation?

$a =$

## Question 25

The radius of the circle is 5 cm. Which is the best estimate for the shortest distance from P to Q around the outside of the circle?



A 9 cm

B 10 cm

C 11 cm

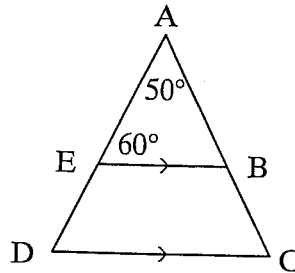
D 12 cm

# YEAR 9 NUMERACY SAMPLE TEST 1 – CALCULATOR ALLOWED

## Question 26

EB is parallel to DC.  $\angle EAB = 50^\circ$ .

$\angle AEB = 60^\circ$ .



What is the size of  $\angle ACD$ ?

A  $70^\circ$

B  $60^\circ$

C  $55^\circ$

D  $50^\circ$

## Question 27

60 boys and 90 girls were asked if they had seen a particular movie. 40% of boys and 60% of girls had seen the movie. What percentage of the group had seen the movie?

%

## Question 28

The number of text messages sent from a phone each day was recorded for a week:

0, 1, 4, 5, 6, 6, 10

Which statement is correct?

A mean  $<$  median  $<$  mode

B mean  $<$  mode  $<$  median

C median  $<$  mode  $<$  mean

D mode  $<$  median  $<$  mean

## Question 29

A cricket team needed to score 185 runs from 20 overs to win a game. After 8 overs the team had scored 65 runs. At what rate did the team need to score the rest of the runs?

runs per over

## YEAR 9 NUMERACY SAMPLE TEST 1 – CALCULATOR ALLOWED

### Question 30

A straight line passes through the points (1, 9) and (5, 1). Which of the following points will the line also pass through?

A (2, 8)

B (3, 5)

C (4, 2)

D (6, 0)

### Question 31

2.7 million seconds would be closest to

A 1 day

B 1 week

C 1 month

D 1 year

### Question 32

A factory makes garden gnomes. The total cost,  $\$C$ , of producing  $n$  gnomes is given by  $C = 350 + 25n$ . The factory receives  $\$35$  for each garden gnome. In a week where the factory produces and sells 180 gnomes, how much **profit** will it make?

\$

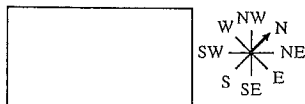
## END OF TEST 1—CALCULATOR ALLOWED



- 1 **\$0.85** (Basic level)
- 2 **A** (Basic level)
- 3 **A** (Intermediate level)
- 4 **9 km** (Basic level)
- 5 **40** (Intermediate level)
- 6 **C** (Basic level)
- 7 **B** (Basic level)
- 8 **A** (Intermediate level)
- 9 **B** (Intermediate level)
- 10 **C** (Intermediate level)
- 11 **B** (Intermediate level)
- 12 **D** (Intermediate level)
- 13 **47 km** (Intermediate level)
- 14 **C** (Advanced level)
- 15 **B** (Basic level)
- 16 **D** (Basic level)
- 17 **120°** (Advanced level)
- 18 **D** (Intermediate level)
- 19 **D** (Basic level)
- 20 **96 cm** (Intermediate level)
- 21 **C** (Intermediate level)
- 22 **B** (Intermediate level)
- 23 **-2 and -3** (Intermediate level)
- 24 **a = 10** (Intermediate level)
- 25 **D** (Advanced level)
- 26 **A** (Advanced level)
- 27 **52%** (Advanced level)
- 28 **A** (Advanced level)
- 29 **10 runs/over** (Advanced level)
- 30 **B** (Advanced level)
- 31 **C** (Intermediate level)
- 32 **\$1450** (Advanced level)

1 Price per apple =  $\$6.80 \div 8$   
=  $\$0.85$

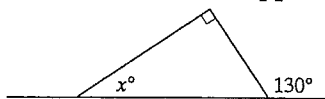
2 The opening in the shed faces south-east.



3 If  $p = -5$ ,  
 $4p^2 = 4 \times (-5)^2$   
=  $4 \times 25$   
=  $100$

4 Time taken =  $45 \text{ min}$   
=  $\frac{3}{4} \text{ h}$   
Speed =  $12 \text{ km every hour}$   
Distance =  $\frac{3}{4}$  of  $12 \text{ km}$   
=  $9 \text{ km}$

5 The exterior angle of a triangle is equal to the sum of the interior opposite angles.



So  $x + 90 = 130$   
 $x = 130 - 90$   
 $x = 40$

6  $1 \text{ kg} = 1000 \text{ g}$   
So  $1 \text{ kg} + 80 \text{ g} = (1000 + 80) \text{ g}$   
=  $1080 \text{ g}$

7

Cars sold by Miracle Motors	
March	
April	
May	
June	



Each symbol represents 8 cars.  
So 42 cars would be represented by  $(42 \div 8)$  symbols or  $5\frac{1}{4}$  symbols.  
The month that has  $5\frac{1}{4}$  symbols is April, so April is the month in which 42 cars were sold.

8 [Change each number to a decimal.]  
 $29\% = 0.29$   
 $\frac{2}{9} = 0.22222... [2 \div 9]$   
 $0.209$   
 $0.2009$

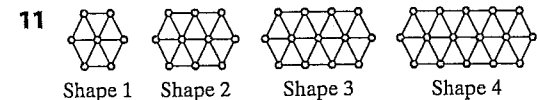
Writing each number with four digits after the decimal point the numbers are  $0.2900, 0.2222, 0.2090$  and  $0.2009$ .

The largest is  $0.2900$ .

So the largest of the numbers is  $29\%$ .

- 9 From  $7:25$  until  $8:00$  is  $35$  minutes.  
So from  $7:25$  until  $8:05$  is  $40$  minutes.  
From  $8:05 \text{ am}$  until  $5:05 \text{ pm}$  is  $9$  hours.  
So the total time is  $9 \text{ h } 40 \text{ min}$ .

10  $3(4a - 1) = 3 \times 4a - 3 \times 1$   
=  $12a - 3$



[Draw up a table.]

Shape	1	2	3	4
Number of pins	7	10	13	16

The number of pins is increasing by 3 each time.

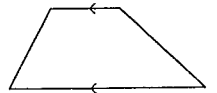
The rule is:

the number of pins =  $3 \times \text{shape number} + 4$   
Now  $40 - 4 = 36$

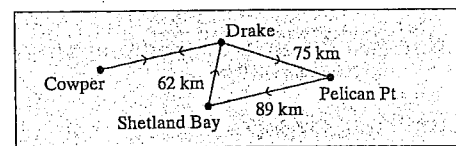
So  $3 \times \text{shape number} = 36$   
shape number =  $36 \div 3$   
=  $12$

So 40 pins will be needed for Shape 12.

- 12 A rhombus has four equal sides.  
An isosceles triangle has two equal sides.  
A regular octagon has eight equal sides.  
The shape that does not necessarily have two equal sides is a trapezium.



13 Length of rally =  $320 \text{ km}$



Lengths in diagram =  $(75 + 89 + 62) \text{ km}$   
=  $226 \text{ km}$

Remaining length =  $(320 - 226) \text{ km}$   
=  $94 \text{ km}$

Distance from Cowper to Drake  
=  $(94 \div 2) \text{ km}$   
=  $47 \text{ km}$

14 Sum of male ages =  $20 \times 13$   
=  $260$

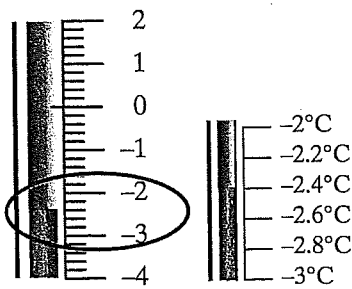
Sum of female ages =  $40 \times 19$   
=  $760$

Total of all ages =  $260 + 760$   
=  $1020$

Total number in choir =  $20 + 40$   
=  $60$

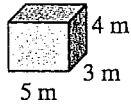
Average age =  $1020 \div 60$   
=  $17$

- 15 The temperature is  $-2.4^{\circ}\text{C}$ .

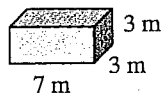


- 16 [Find the volume of each prism.]

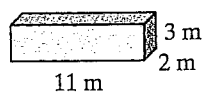
$$V = (5 \times 4 \times 3) \text{ m}^3 \\ = 60 \text{ m}^3$$



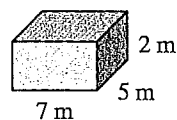
$$V = (7 \times 3 \times 3) \text{ m}^3 \\ = 63 \text{ m}^3$$



$$V = (11 \times 2 \times 3) \text{ m}^3 \\ = 66 \text{ m}^3$$



$$V = (7 \times 5 \times 2) \text{ m}^3 \\ = 70 \text{ m}^3$$



The largest volume is  $70 \text{ m}^3$ .

The rectangular prism with the greatest volume is D.

- 17 The polygon has 8 angles so it is an octagon.

$$\begin{aligned} \text{Angle sum of an octagon} &= (8 - 2) \times 180^{\circ} \\ &= 6 \times 180^{\circ} \\ &= 1080^{\circ} \end{aligned}$$

Now 4 angles measure  $150^{\circ}$ .

$$\begin{aligned} \text{Total of those angles} &= 4 \times 150^{\circ} \\ &= 600^{\circ} \end{aligned}$$

$$\begin{aligned} \text{Total of remaining angles} &= 1080^{\circ} - 600^{\circ} \\ &= 480^{\circ} \end{aligned}$$

$$\begin{aligned} \text{Size of each remaining angle} &= 480^{\circ} \div 4 \\ &= 120^{\circ} \end{aligned}$$

- 18 There are 36 possible results.

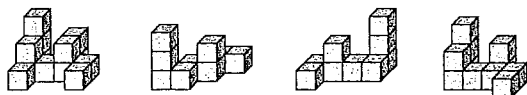
Possible results giving 8 are:

$$2 + 6, 3 + 5, 4 + 4, 5 + 3 \text{ and } 6 + 2.$$

So there are 5 outcomes that give 8.

$$\text{Probability of 8} = \frac{5}{36}$$

- 19 All four views could be Mel's object.



The first view could be Mel's object viewed from the front. The side view is the right side.

The second view could be Mel's object viewed from the front. The side view is the left side.

The third view could be Mel's object viewed from the back. The side view is the left side.

The fourth view could be Mel's object viewed from the front. The side view is the right side.

- 20 The photo was 7.5 cm wide and is now 60 cm wide.

$$\begin{aligned} \text{Number of times larger} &= 60 \div 7.5 \\ &= 8 \end{aligned}$$

The photo was 12 cm long.

$$\begin{aligned} \text{New length} &= 8 \times 12 \text{ cm} \\ &= 96 \text{ cm} \end{aligned}$$

21

$x$	1	1.5	2	3	6
$y$	6	4	3	2	1

[Consider each option.]

$$y = 6x$$

When  $x = 1$ ,

$$\begin{aligned} y &= 6 \times 1 \\ &= 6 \end{aligned}$$

When  $x = 1.5$ ,

$$\begin{aligned} y &= 6 \times 1.5 \\ &= 9 \text{ (not 6)} \end{aligned}$$

This option is not correct.

$$y = \frac{x}{6}$$

When  $x = 1$ ,

$$y = \frac{1}{6} \text{ (not 6)}$$

This option is not correct.

$$y = \frac{6}{x}$$

When  $x = 1$ ,

$$\begin{aligned} y &= \frac{6}{1} \\ &= 6 \end{aligned}$$

When  $x = 1.5$ ,

$$\begin{aligned} y &= \frac{6}{1.5} \\ &= 4 \end{aligned}$$

When  $x = 2$ ,

$$\begin{aligned} y &= \frac{6}{2} \\ &= 3 \end{aligned}$$

When  $x = 3$ ,

$$\begin{aligned} y &= \frac{6}{3} \\ &= 2 \end{aligned}$$

When  $x = 6$ ,

$$\begin{aligned} y &= \frac{6}{6} \\ &= 1 \end{aligned}$$

This option is correct.

The correct rule is  $y = \frac{6}{x}$ .

- 22 [Try each option.]

$$6789 \div 31 = 219$$

So 31 is a factor of 6789.

$$6789 \div 53 = 128.094339\dots$$

So 53 is not a factor of 6789.

$$6789 \div 73 = 93$$

So 73 and 93 are factors of 6789.

53 is not a factor of 6789

- 23 [The two numbers multiply to give a positive number so they have the same sign.]

The two numbers also add to give a negative number, so both must be negative.]

$$-2 + (-3) = -5$$

$$-2 \times -3 = 6$$

The numbers are  $-2$  and  $-3$ .

[Or  $-3$  and  $-2$ ]

24  $7a - 15 = 3a + 25$

[Add 15 to both sides.]

$$7a = 3a + 40$$

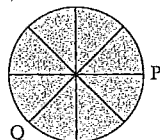
[Subtract  $3a$  from both sides.]

$$4a = 40$$

[Divide both sides by 4.]

$$a = 10$$

- 25 The circle is divided into eight sectors.



So Q is  $\frac{3}{8}$  of the way around the circle.

The radius is 5 cm so the diameter is 10 cm.

$$\begin{aligned} \text{The distance from P to Q} &= \frac{3}{8} \times \pi \times 10 \text{ cm} \\ &= 11.78... \text{ cm} \end{aligned}$$

Of the options, the best estimate for the distance is 12 cm.

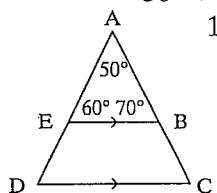
- 26 Angles in a triangle add to  $180^\circ$ .

$$\text{So } \angle EAB + \angle AEB + \angle ABE = 180^\circ$$

$$50^\circ + 60^\circ + \angle ABE = 180^\circ$$

$$110^\circ + \angle ABE = 180^\circ$$

$$\begin{aligned} \angle ABE &= 180^\circ - 110^\circ \\ &= 70^\circ \end{aligned}$$



Now  $\angle ACD = \angle ABE$  (alternate angles, EB is parallel to DC)

$$\text{So } \angle ACD = 70^\circ$$

- 27 Number of boys who had seen the movie

$$= 40\% \text{ of } 60$$

$$= \frac{40}{100} \times 60$$

$$= 24$$

Number of girls who had seen the movie

$$= 60\% \text{ of } 90$$

$$= \frac{60}{100} \times 90$$

$$= 54$$

Number who had seen the movie

$$= 24 + 54$$

$$= 78$$

Total number of boys and girls

$$= 60 + 90$$

$$= 150$$

Percentage who had seen the movie

$$= \frac{78}{150} \times 100\%$$

$$= 52\%$$

- 28 0, 1, 4, 5, 6, 6, 10

$$\text{Mean} = (0 + 1 + 4 + 5 + 6 + 6 + 10) \div 7$$

$$= 32 \div 7$$

$$= 4.57...$$

There are two scores of 6 and only one of all the others.

So the mode is 6.

There are 7 scores, so the middle score is the fourth score.

So the median is 5.

So mean < median < mode

- 29 Number of runs still needed =  $185 - 65$

$$= 120$$

Number of overs remaining =  $20 - 8$

$$= 12$$

So 120 more runs are needed off 12 overs.

Required run rate =  $(120 \div 12)$  runs/over

$$= 10 \text{ runs per over}$$

- 30 (1, 9) and (5, 1)

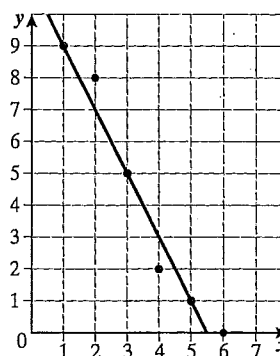
The rule that both points obey is

$$2x + y = 11$$

$$[2 \times 1 + 9 = 11; 2 \times 5 + 1 = 11]$$

Of the options, the only point that obeys this rule is (3, 5).

$$[2 \times 3 + 5 = 11]$$



The point that also lies on the line is (3, 5).

- 31 2.7 million seconds

$$= 2\,700\,000 \text{ s}$$

$$= (2\,700\,000 \div 60) \text{ min}$$

$$= 45\,000 \text{ min}$$

$$= (45\,000 \div 60) \text{ h}$$

$$= 750 \text{ h}$$

$$= (750 \div 24) \text{ days}$$

$$= 31.25 \text{ days}$$

So 2.7 million seconds is about 1 month.

- 32  $C = 350 + 25n$

When  $n = 180$ ,

$$C = 350 + 25 \times 180$$

$$= 350 + 4500$$

$$= 4850$$

So the cost to make 180 gnomes is \$4850.

The money received from the sale of

$$180 \text{ gnomes} = 180 \times \$35$$

$$= \$6300$$

$$\text{Profit} = \$6300 - \$4850$$

$$= \$1450$$