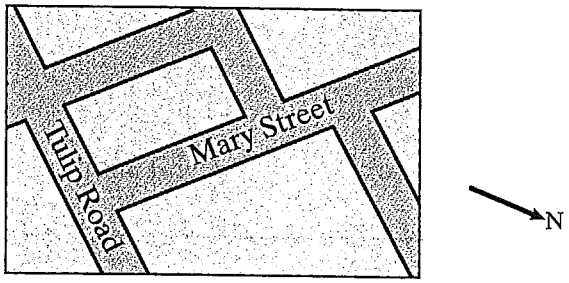
Year 9 Numeracy Sample Test 2

Non-calculator

40 MIN

Question 1

Donna is driving along Mary Street towards Tulip Road.



In what direction is she travelling?

A north-east **B** north-west

C south-east **D** south-west

Question 2

25% of workers at a factory are casual employees and the rest are permanent members of staff. If there are 80 workers altogether, how many are permanent members of staff?

Question 3

Jon has a standard die. What is the probability that Jon gets a 5 when he throws the die?

A $\frac{1}{3}$ **B** $\frac{1}{4}$ **C** $\frac{1}{5}$ **D** $\frac{1}{6}$

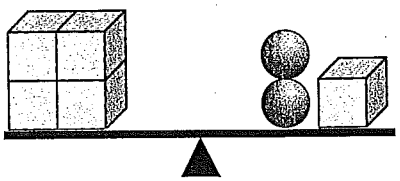
Question 4

The rule for a pattern is 'double the previous number and add 5'. If the first number in this pattern is 2, what is the fourth number?

YEAR 9 NUMERACY SAMPLE TEST 2—NON-CALCULATOR

Question 5

This balance shows that 4 blocks have the same mass as 2 balls and a block.

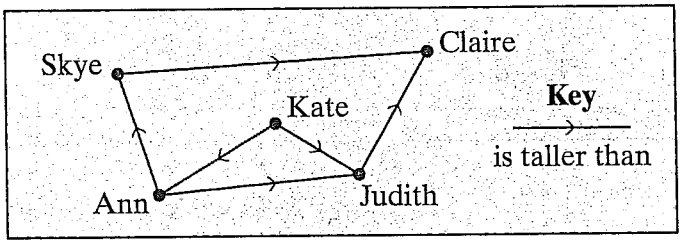


How many blocks would balance 6 balls?

A 3 **B** 7 **C** 9 **D** 10

Question 6

Five girls compared their heights. The diagram shows the results.



Who is the shortest?

A Ann **B** Kate **C** Claire **D** Judith

Question 7

Avril arrived at work at 8:50 am and left at 4:15 pm. How long was Avril at work?

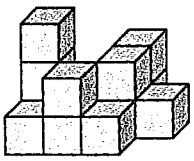
A 7 h 25 min **B** 7 h 35 min

C 8 h 25 min **D** 8 h 35 min

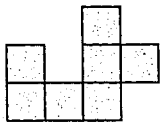
YEAR 9 NUMERACY SAMPLE TEST 2—NON-CALCULATOR

Question 8

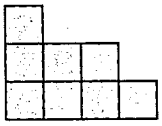
This object is made from 12 cubes.



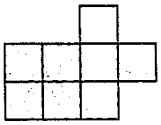
What is the view from the top?



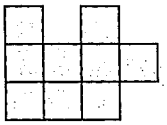
A



B



C



D

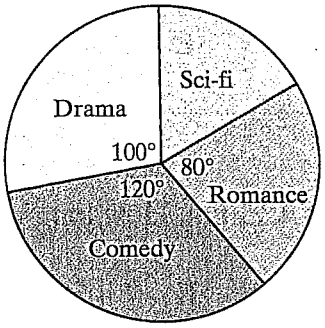
Question 9

What is $12 \div \frac{1}{2}$?

A 6 **B** 8 **C** 16 **D** 24

Question 10

This sector graph was drawn to show the results when 60 people were asked what their favourite type of movie was. How many people chose sci-fi movies?



Question 11

1 m and 85 cm is the same as

A 1850 mm **B** 1085 mm

C 1.085 m **D** none of these

YEAR 9 NUMERACY SAMPLE TEST 2—NON-CALCULATOR

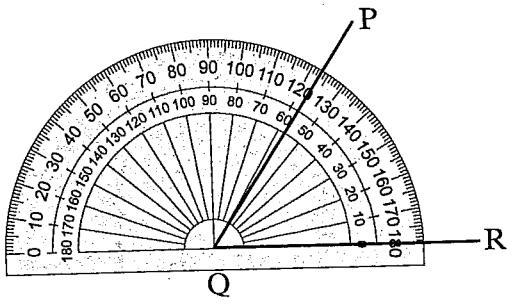
Question 12

When $a = 2$ and $b = 5$, what is the value of $3ab^2$?

A 60 **B** 150 **C** 300 **D** 900

Question 13

What is the size of ∠PQR?



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Question 14

Which of these is not necessarily a parallelogram?

A rectangle **B** rhombus

C square **D** trapezium

Question 15

Which is equivalent to $-x^2 + 5x$?

A $4x^3$ **B** $x^2 - 5x$ **C** $5x - x^2$ **D** $x(x - 5)$

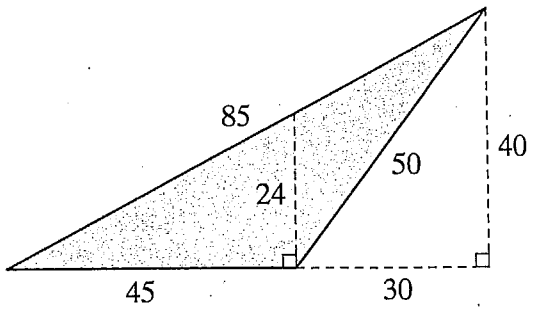
Question 16

There are 60 red apples in a box. The ratio of red to green apples in the box is 5 to 3.
How many green apples are in the box?

YEAR 9 NUMERACY SAMPLE TEST 2—NON-CALCULATOR

Question 17

Which calculation will give the area of the shaded triangle?



A $\frac{1}{2} \times 45 \times 85$

B $\frac{1}{2} \times 45 \times 50$

C $\frac{1}{2} \times 45 \times 40$

D $\frac{1}{2} \times 45 \times 24$

Question 18

$3(2x + 1) = 9x - 6$

What is the value of x in this equation?

$x =$ ☐

Question 19

Each of the dimensions of a rectangular prism is three times larger than that of a smaller rectangular prism. How many times larger is the volume of the larger prism than that of the smaller prism?

A 27 **B** 9 **C** 6 **D** 3

Question 20

Consider the scores 3, 4, 4, 9.

Another score of 4 is included with these scores. Which will change?

A mean **B** median **C** mode **D** range

YEAR 9 NUMERACY SAMPLE TEST 2—NON-CALCULATOR

Question 21

Which set of fractions is arranged from lowest to highest?

A $\frac{5}{8}, \frac{2}{3}, \frac{7}{12}, \frac{3}{4}$

B $\frac{2}{3}, \frac{7}{12}, \frac{5}{8}, \frac{3}{4}$

C $\frac{2}{3}, \frac{3}{4}, \frac{5}{8}, \frac{7}{12}$

D $\frac{7}{12}, \frac{5}{8}, \frac{2}{3}, \frac{3}{4}$

Question 22

Which statement is correct?

A $0.3 < 0.04$

B $-0.6 > -0.7$

C $-0.2 < -0.235$

D $-2.5 > -1.8$

Question 23

A pattern has been formed with shapes.

What is the 90th shape in this pattern?

A 

B 

C 

D 

Question 24

An isosceles (but not right-angled) triangle is cut along its axis of symmetry.
What description applies to the two resulting triangles?

A equilateral

B isosceles and right-angled

C isosceles but not right-angled

D right-angled but not isosceles

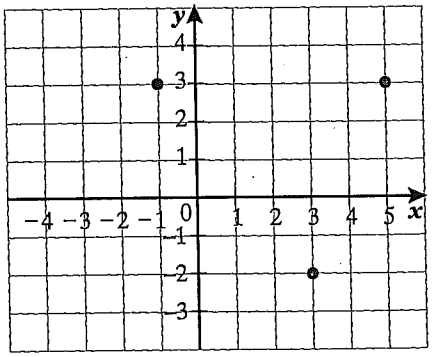
Question 25

Ray left home at 9:40 am and travelled 315 km, arriving at his destination at 1:10 pm.

What was Ray's average speed for the journey? _____ km/h

Question 26

Hayden is drawing a parallelogram on this grid. He has marked three of the vertices of the parallelogram. Where will the fourth vertex go?



A (−1, −2) **B** (−3, −2) **C** (−2, −3) **D** (−1, −3)

Question 27

A television was being sold for $560, but the price increased suddenly by 5%. Which calculation gives the new sale price?

A $560 + 5$ **B** 560×0.5

C 560×0.05 **D** 560×1.05

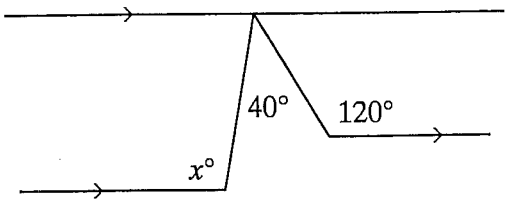
Question 28

Which is equal to 4^3?

A 2^6 **B** 2^9 **C** 3^4 **D** 3^6

Question 29

What is the value of x?

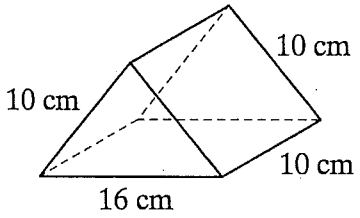


A 80 **B** 100 **C** 120 **D** 140

Question 30

The area of the front triangular face of this prism is 48 cm^2.

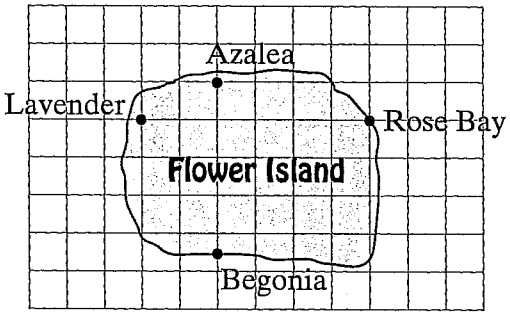
What is the total area of all the surfaces of the prism?



cm^2

Question 31

This is a map of Flower Island.



The actual distance from Lavender to Rose Bay is 180 km. Which is the best approximation of the actual distance, in kilometres, from Begonia to Azalea?

A 120 **B** 135 **C** 150 **D** 165

Question 32

David has a bag of marbles, some of which are blue, some yellow and the rest are green. David knows that if he takes a marble from the bag without looking, there is 1 chance in 4 of selecting a blue marble and 1 chance in 3 of selecting a yellow marble. What is the probability of selecting a green marble?

A $\frac{3}{4}$ **B** $\frac{1}{12}$ **C** $\frac{5}{12}$ **D** $\frac{7}{12}$

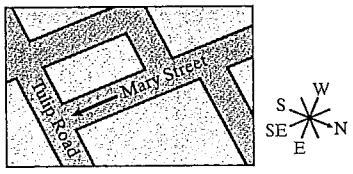
END OF TEST 2—NON-CALCULATOR

YEAR 9 Numeracy Sample Test 2

Pages 52–59

1 **C** (Basic level)
2 **60** (Basic level)
3 **D** (Basic level)
4 **51** (Intermediate level)
5 **C** (Basic level)
6 **C** (Basic level)
7 **A** (Intermediate level)
8 **A** (Basic level)
9 **D** (Intermediate level)
10 **10** (Intermediate level)
11 **A** (Basic level)
12 **B** (Intermediate level)
13 **57°** (Intermediate level)
14 **D** (Intermediate level)
15 **C** (Advanced level)
16 **36** (Intermediate level)
17 **C** (Basic level)
18 $x = 3$ (Intermediate level)
19 **A** (Intermediate level)
20 **A** (Intermediate level)
21 **D** (Advanced level)
22 **B** (Intermediate level)
23 **B** (Intermediate level)
24 **D** (Advanced level)
25 **90 km/h** (Advanced level)
26 **B** (Advanced level)
27 **D** (Advanced level)
28 **A** (Advanced level)
29 **B** (Advanced level)
30 **456 cm²** (Advanced level)
31 **B** (Advanced level)
32 **C** (Advanced level)

1 Donna is travelling south-east.

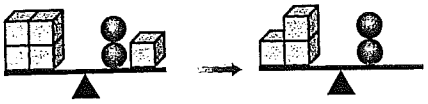


2 25% are casual workers.
Now 25% is one-quarter.
Number of casual workers $= 80 \div 4$
$= 20$
Number of permanent staff $= 80 - 20$
$= 60$

3 There are 6 possible outcomes when a die is tossed. 5 is one of those outcomes.
Probability of $5 = \frac{1}{6}$

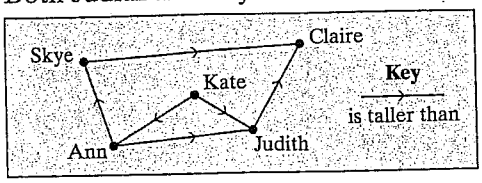
4 First number $= 2$
Second number $= 2 \times 2 + 5$
$= 4 + 5$
$= 9$
Third number $= 2 \times 9 + 5$
$= 18 + 5$
$= 23$
Fourth number $= 2 \times 23 + 5$
$= 46 + 5$
$= 51$

5 [Remove one block from each side.]



3 blocks balance 2 balls.
So 3×3 blocks will balance 3×2 balls.
9 blocks will balance 6 balls.

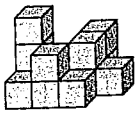
6 Kate is taller than both Ann and Judith.
Ann is taller than both Judith and Skye.
Both Judith and Skye are taller than Claire.



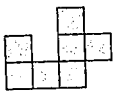
Claire is the shortest.

7 From 8:50 am until 9:00 am is 10 minutes.
From 9 am until 4 pm is 7 hours.
From 4 pm until 4:15 pm is 15 minutes.
Total time $= 10$ min $+ 7$ h $+ 15$ min
$= 7$h 25 min

8 There are 12 cubes altogether.
When viewed from the front there are two rows on the far left, one row in the second position from the left, three rows in the third position from the left and just one row on the right.

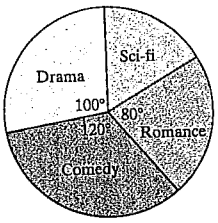


The view from the top is



9 $12 \div \frac{1}{2} = 12 \times 2$
$= 24$
[There are two halves in every one whole. So, there are 24 halves in 12.]

10 Total of the angles $= 360°$
Given angles $= 120° + 80° + 100°$
$= 300°$
Remaining angle $= 360° - 300°$
$= 60°$
Fraction who chose sci-fi movies $= \frac{60}{360}$
$= \frac{1}{6}$
Now, the whole graph represents 60 people.
Number who chose sci-fi movies $= 60 \div 6$
$= 10$



11 1 m = 100 cm

So 1 m + 85 cm = 185 cm

[But this is not one of the options.]

Now 1 cm = 10 mm

So 185 cm = 1850 mm

1 m + 85 cm = 1850 mm

12 When $a = 2$ and $b = 5$,

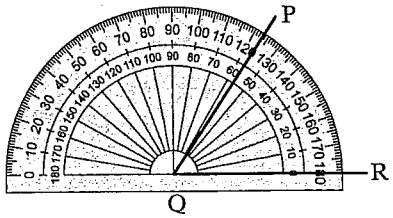
$3ab^2 = 3 \times 2 \times 5^2$

$= 3 \times 2 \times 25$

$= 150$

13 $\angle PQR = 57°$

[R is to the right of the vertex Q and so the inside scale on the protractor is used.]



14 A parallelogram is a quadrilateral with both pairs of opposite sides parallel.

Rectangles, rhombuses and squares are all quadrilaterals with both pairs of opposite sides parallel so they are all parallelograms.

A trapezium has one pair of opposite sides parallel. It is not a parallelogram. [But all parallelograms are trapeziums.]

15 $-x^2 + 5x = 5x - x^2$

[$-x^2$ and $5x$ are unlike terms so they cannot be added together. $x(x - 5) = x^2 - 5x$

$= -(-x^2 + 5x)$]

16 There are 60 red apples.

The ratio of red to green apples is 5 to 3.

So for every 5 red apples there are 3 green ones.

Now 60 ÷ 5 = 12

So there are 12 lots of 5 red apples.

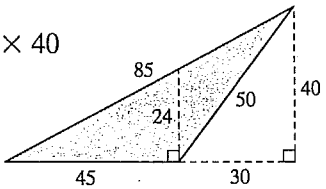
[So there will be 12 lots of 3 green apples.]

Number of green apples = 3 × 12

= 36

17 Area $= \frac{1}{2} \times$ base $\times$ perpendicular height

$= \frac{1}{2} \times 45 \times 40$



[The height must be the perpendicular height so it is not 85 or 50 because those measurements are not at right angles to the base. The measurement 24 is at right angles to the base but does not give the height of the triangle.]

18 $3(2x + 1) = 9x - 6$

[Remove brackets]

$6x + 3 = 9x - 6$

[Add 6 to both sides.]

$6x + 9 = 9x$

[Subtract $6x$ from both sides.]

$9 = 3x$

[Divide both sides by 3.]

$3 = x$

So $x = 3$

19 The larger rectangular prism is 3 times longer, 3 times wider and 3 times higher than the smaller prism.

The number of times that the volume is greater = 3 × 3 × 3

= 27

[If the smaller prism has length l, breadth b and height h its volume is lbh. The larger prism has volume $3l \times 3b \times 3h = 27lbh$.]

20 3, 4, 4, 9

Mean = (3 + 4 + 4 + 9) ÷ 4

= 20 ÷ 4

= 5

Median = (4 + 4) ÷ 2

= 4

Mode = 4

Range = 9 − 3

= 6

A new score of 4 is included: 3, 4, 4, 4, 9.

Because this new score is smaller than the original mean, the new mean will also be smaller.

The mean will change.

[The mean will change to 24 ÷ 5 = 4.8. The median and mode will still both be 4. The range will still be 6.]

21 [Change each fraction so they all have the same denominator, 24.]

$\frac{2}{3} = \frac{16}{24}$

$\frac{3}{4} = \frac{18}{24}$

$\frac{5}{8} = \frac{15}{24}$

$\frac{7}{12} = \frac{14}{24}$

So from lowest to highest the fractions are $\frac{14}{24}, \frac{15}{24}, \frac{16}{24}, \frac{18}{24}$.

The set of fractions in order from lowest to highest is $\frac{7}{12}, \frac{5}{8}, \frac{2}{3}, \frac{3}{4}$.

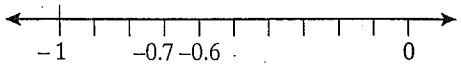
22 Consider each option:

$0.3 < 0.04$?

$0.30 > 0.04$

This option is not correct.

$-0.6 > -0.7$?



This option is correct.

$-0.2 < -0.235$?

$-0.200 > -0.235$

This option is not correct.

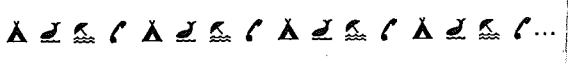
$-2.5 > -1.8$?

$-2.5 < -1.8$

This option is not correct.

The correct statement is $-0.6 > -0.7$.

23 The pattern has four shapes that repeat.

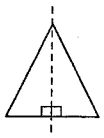


Every fourth shape will be  .

So the 88th shape will be .

The 89th shape will be  and the 90th shape will be  .

24 The triangles will be right-angled but not isosceles.



25 Distance = 315 km

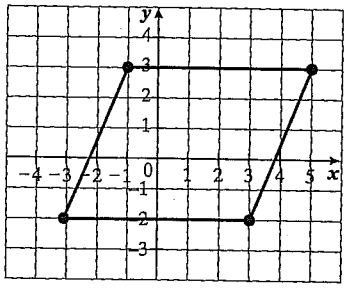
From 9:40 am until 12:40 pm is 3 hours.

From 12:40 pm until 1:10 pm is 30 minutes or half an hour.

Time taken = 3.5 h

Average speed = (315 ÷ 3.5) km/h
= (630 ÷ 7) km/h
= 90 km/h

26 The fourth vertex will be at (−3, −2).



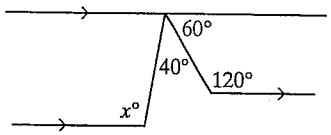
27 The price has increased by 5%.
Now 5% = 5 ÷ 100
= 0.05

So the increase in price is 0.05 × 560.
The new price is 560 + 0.05 × 560
= 560 × 1 + 560 × 0.05
= 560 × (1 + 0.05)
= 560 × 1.05

28 $4^3 = 4 \times 4 \times 4$
But $4 = 2 \times 2$
So $4^3 = 2 \times 2 \times 2 \times 2 \times 2 \times 2$
$= 2^6$
$[4^3 = (2^2)^3 = 2^{2 \times 3} = 2^6]$

29 When lines are parallel, the co-interior angles add to 180°.

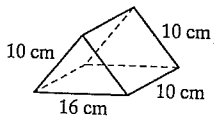
So an angle of 60° is at the top right.



When lines are parallel, the alternate angles are equal.

So $x = 40 + 60$
$= 100$

30 The front and back triangular faces both have area 48 cm².



There are three rectangular faces.

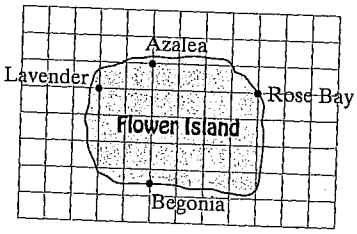
Total area of the rectangular faces
= (16 × 10 + 10 × 10 + 10 × 10) cm²
= (160 + 100 + 100) cm²
= 360 cm²

Total surface area = (2 × 48 + 360) cm²
= (96 + 360) cm²
= 456 cm²

31 From Lavender to Rose Bay on the map is 6 units.

So 6 units represents 180 km.

1 unit will represent (180 ÷ 6) km or 30 km.



The distance from Azalea to Begonia is about $4\frac{1}{2}$ units.

Now $4\frac{1}{2} \times 30$ km = $(4 \times 30 + \frac{1}{2}$ of 30) km
= (120 + 15) km
= 135 km

The best approximation is 135 km.

32 Probability of blue = $\frac{1}{4}$

Probability of yellow = $\frac{1}{3}$

Probability of blue or yellow = $\frac{1}{4} + \frac{1}{3}$
$= \frac{3}{12} + \frac{4}{12}$
$= \frac{7}{12}$

Probability of green = $1 - \frac{7}{12}$
$= \frac{5}{12}$