CANDIDATE
NAME

CENTER
NUMBER

CANDIDATE
NUMBER

MATHEMATICS (US) **0444/11**

Paper 1 (Core) **May/June 2012**

1 hour

Candidates answer on the Question Paper.

Additional Materials: Geometrical Instruments

READ THESE INSTRUCTIONS FIRST

Write your Center number, candidate number, and name on all the work you hand in.
Write in dark blue or black pen.
You may use a pencil for any diagrams, or graphs.
Do not use staples, paper clips, highlighters, glue or correction fluid.
DO **NOT** WRITE IN ANY BARCODES.

Answer **all** questions.
CALCULATORS MUST NOT BE USED IN THIS PAPER.
All answers should be given in their simplest form.
If work is needed for any question it must be shown in the space provided.

The number of points is given in parentheses [ ] at the end of each question or part question.
The total of the points for this paper is 56.

This document consists of **12** printed pages.

[Turn over

Formula List

Area, A, of triangle, base b, height h. $\qquad\qquad A = \dfrac{1}{2}bh$

Area, A, of circle, radius r. $\qquad\qquad A = \pi r^2$

Circumference, C, of circle, radius r. $\qquad\qquad C = 2\pi r$

Lateral surface area, A, of cylinder of radius r, height h. $\qquad A = 2\pi rh$

Surface area, A, of sphere of radius r. $\qquad\qquad A = 4\pi r^2$

Volume, V, of prism, cross-sectional area A, length l. $\qquad V = Al$

Volume, V, of cylinder of radius r, height h. $\qquad V = \pi r^2 h$
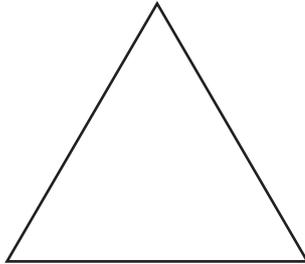
Volume, V, of sphere of radius r. $\qquad\qquad V = \dfrac{4}{3}\pi r^3$

1 The temperature at the top of a mountain is –12°C.
The temperature at the bottom of the mountain is 18°C.

Work out the difference in these temperatures.

Answer .... °C [1]

2

The lengths of each side of this triangle are the same.

(a) Write down the mathematical name for this triangle.

Answer(a) .... [1]

(b) Write down the number of lines of symmetry for the triangle.

Answer(b) .... [1]

3 Work out the number of minutes from 18 27 on Tuesday to 03 19 on Wednesday.

Answer .... min [2]

4 There were 248 000 visitors to a park in 2009.
The number of visitors to the park increased by 5% in 2010.

Work out how many **more** visitors there were in 2010.

Answer .... [2]

5 $w = 3a - 5b$

Evaluate w when $a = 2$ and $b = -3$.

Answer w = ... [2]
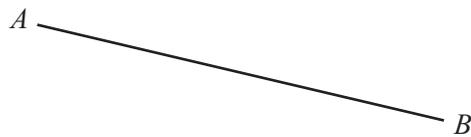
6 One bracelet costs 85 cents and one necklace costs $7.50.

Write down an expression, **in dollars**, for the total cost of b bracelets and n necklaces.

Answer $ .... [2]

7

A

B

Using a straight edge and compass only, construct the perpendicular bisector of *AB*.
Show all your construction arcs. [2]

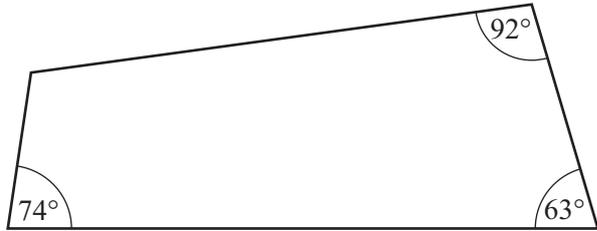**8** **(a)** A quadrilateral has four sides of equal length and two pairs of equal angles.

Write down the mathematical name for this quadrilateral.

Answer(a) .... [1]

(b)

NOT TO SCALE

Three of the angles in a quadrilateral are 63°, 74° and 92°.

Work out the size of the fourth angle.

Answer(b) .... [1]

9 Solve the equation $4x - 2 = 7$.

Answer x = ... [2]

10 $1 = 0.6038 pounds (£)

John changes £600 into dollars.
Estimate how many dollars he receives.

Answer $ .... [2]

11 Simplify this expression.

$$\frac{6a^3}{9ab^2}$$

Answer .... [2]

12

$B(4, y)$

$M(0, 5)$

NOT TO SCALE

$A(x, 1)$
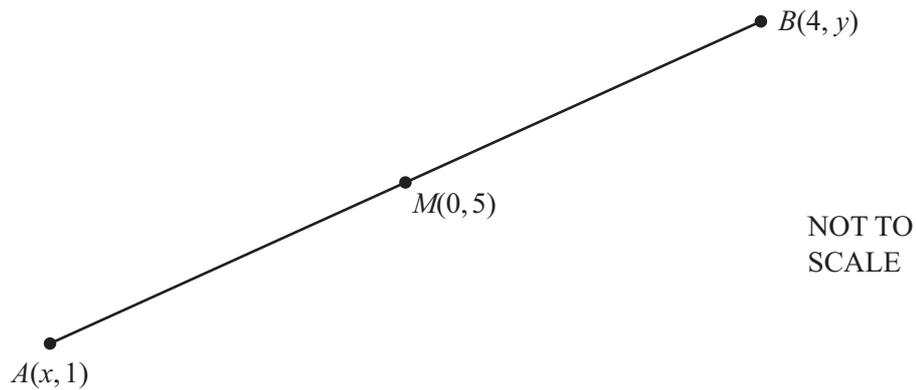
The diagram shows three points $A(x, 1)$, $B(4, y)$ and $M(0, 5)$.
M is the midpoint of the line AB.

Find the values of x and y.

Answer x = ...

$y =$ .... [2]

13 **(a)** Write down all the factors of 15.

Answer(a) .... [1]

(b) Factor completely.
$$15p^2 + 24pt$$

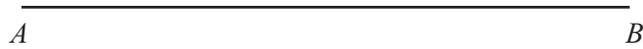*Answer(b)* .... [2]

14 Triangle *ABC* has sides *AB* = 40 m, *BC* = 25 m and *AC* = 35 m.

Using a scale of 1 cm to represent 5 m, construct triangle *ABC*.
The construction must be completed using a ruler and compass only.
All construction arcs must be clearly shown.

Answer

A   B
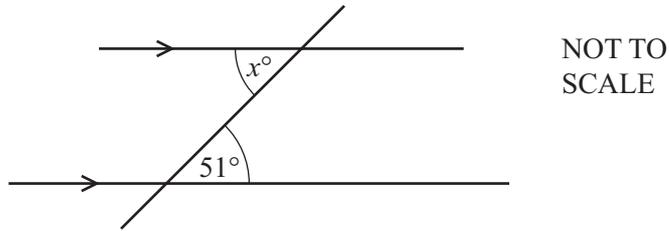
[3]

15 Simplify $1\dfrac{5}{6} + \dfrac{9}{10}$.

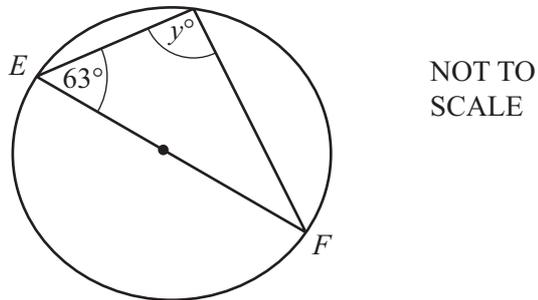Give your answer as a mixed number in its simplest form.

Answer .... [3]

                                                                   [Turn over

16 (a) Find the value of *x*.

NOT TO SCALE

x°

51°

Answer(a) x = ... [1]

(b) *EF* is a diameter of the circle.

Find the value of *y*.

E

63°

y°

F

NOT TO SCALE

Answer(b) y = ... [1]

(c) Find the value of *z* in this isosceles triangle.

48°

z°

NOT TO SCALE
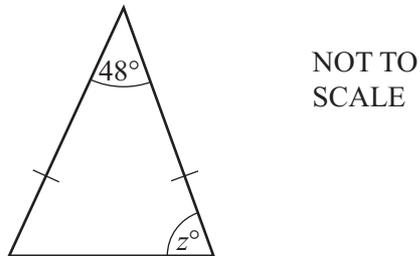
Answer(c) z = ... [1]

17 Solve the system of linear equations.

$$x + 7y = 19$$
$$3x + 5y = 9$$

Answer x = ...

y = ... [3]

18
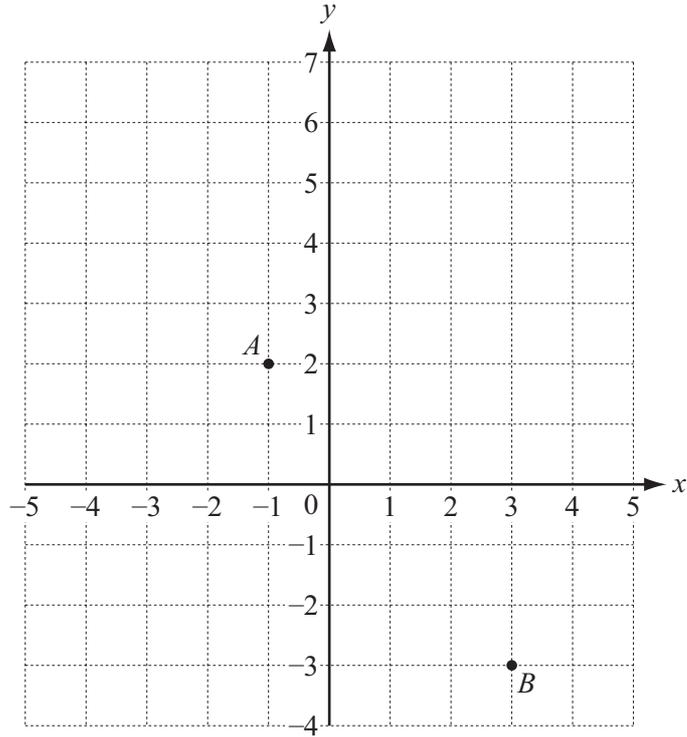
(a) Write down the co-ordinates of point *A*.

Answer(a) (.............. , ...) [1]

(b) Write $\overrightarrow{AB}$ as a column matrix.

Answer(b) $\overrightarrow{AB}$ = $\begin{pmatrix} \\ \\ \end{pmatrix}$ [1]

(c) $\overrightarrow{AC} = \begin{pmatrix} 2 \\ 3 \end{pmatrix}$

Write down the co-ordinates of *C*.

Answer(c) (.............. , ...) [1]

19 **(a)** Write 326.413 correct to 2 significant digits.

Answer(a) .... [1]

(b) Find the square root of one million.

Answer(b) .... [2]

20 **(a)** Simplify

$$4p + 3q + 5p - 7q.$$

Answer(a) .... [2]

(b) Solve for *x*.

$$g = 2x + y$$

Answer(b) x = ... [2]

21

$$13 \quad 17 \quad 13 \quad 17 \quad 19 \quad 13 \quad 31 \quad 21 \quad 29$$

(a) For the numbers above, find

(i) the range,

Answer(a)(i) .... [1]

(ii) the median.

Answer(a)(ii) .... [2]

(b) Write down the only number in the list which is **not** a prime number.

Answer(b) .... [1]
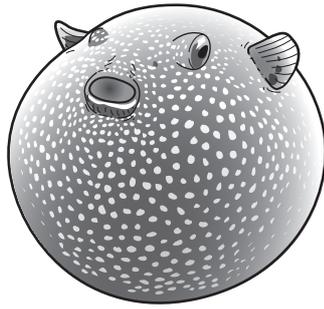
Question 22 is printed on the next page.

22 A puffer fish inflates to deter predators.
    When inflated, a puffer fish is considered to be spherical.

NOT TO
SCALE

The greatest distance across the inflated puffer fish is 60 cm.

Find the volume of the inflated puffer fish.
Give your answer in terms of π.

Answer .... cm^3 [4]