

ANSWERS – Preliminary Course for Intermediate Students **YOUR TURN!**

INA1 Ordering

- a) 809
b)

Units	Tenths	Hundredths	Thousandths
0	9	0	9
0	9	9	
0	0	9	9
9	0	9	

- c) 0.099, 0.909, 0.99, 9.09
d) SAME!
e) -6, -5, -1, 2, 11

INA2 Place Value

- a) 13600
b) 13.6
c) 3.6
d) 1300
e) 136
f) 367
g) 0.136
h) 0.0013
i) 121.77
j) 121770

INA3 Rounding

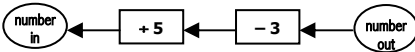
- a) 123460
b) 123500
c) 123000
d) 59900
e) 59900
f) 60000

INA4 Estimation

- a) 35000000
b) 10

INA5 Reversing

- a) 23



- b) $270 - 120 = £150$, $150 \div 15 = 10m$
c) i) 9990 ii) 0.999

INA6 Exchange Rates

- a) €16.43
b) \$15.5
c) 90.551 inches
d) 102 metres

INA7 Value/Ratio

- a) 75
b) i) B (is better)
ii) 0.16p
c) £5.60 (or £5.6)

INA8 BODMAS

- a) 22
b) 0
c) $(1 + 2) \times 5 = 15$
d) $(2 + 3) \times 6 = 30 \div (6 - 5)$

INA9 Index Form

- a) $4^3 5^2$
b) $5 \times 5 \times 5 \times 5 \times 5$
c) 1594323
d) 191
e) 64
f) 9
g) 6
h) $2^3 5^3$ (or $2^3 \times 5^3$)

INA10 Fraction/Decimals

- a) 0.6
b) 2.75
c) $\frac{1}{4}$
d) $\frac{1}{4}$
e) $\frac{7}{8}$
f) $\frac{14}{25}$
g) $\frac{1}{8}$ & $\frac{1}{25}$ (terminates)

INA11 Fraction/Decimals/%

- a) 48%
b) 0.32 (or .32)
c) 27.5%
d) $\frac{3}{50}$

INA13 Fraction/% of Amounts

- a) £168
b) $36 \frac{2}{11}$ cm

INA14 Order Fractions

- a) $\frac{22}{33}$ is smaller than $\frac{24}{33}$; so $\frac{2}{3}$ is smaller

than $\frac{8}{11} \cdot \frac{8}{11}$ is bigger.

- b) $\frac{1}{5}, \frac{1}{4}, \frac{1}{3}, \frac{2}{5}, \frac{1}{2}, \frac{3}{5}, \frac{2}{3}, \frac{3}{4}, \frac{4}{5}$

- c) $\frac{35}{50}$ (or $\frac{7}{10}$) or other correct answer

INA15 Simplify Expressions

- a) 7a
b) 5b
c) $c - d$ (or $1c - 1d$)
d) $-1 - 3d$ (or $-3d - 1$)
e) 10e
f) 9gh (or 9hg)

INA16 Substitutions

- a) -11
b) 28

INA17 Algebra

- a) $500 - 45x$ (pence) or $£(5 - 0.45x)$
b) $9, 2n + 1$

INA18 Coordinates

- a) B(2, 4), D(-4, -3), E(4, -2), F(0, -4)
b) (0, -2.5)
c) G(-1, -1)

ISS1 Angle Calculations

- a) $a = 25^\circ$, $b = 155^\circ$, $c = 125^\circ$
b) Z
c) C
d) F
e) F
f) Then form a kind of Z, **but the ends of the Z are not parallel**
g) $b = 50^\circ$ Z-angle
 $c = 130^\circ$ C-angle or straight line with b
 $d = 50^\circ$ F-angle or other reason
 $e = 55^\circ$ F-angle
 $f = 75^\circ$ Angles in a triangle

ISS2 Quadrilaterals

- a) Kite, Irregular Quadrilateral ONLY
b) Trapezium
c) Trapezium
d) & e) & f) self check
g) parallelogram & rhombus
h) square & rhombus


ISS3 Metric/imperial

self check

ISS4 Symmetry

- a) Kite i.e. b/c)

Name of Shape	No of lines of Symmetry	Order of Rotational Symmetry
square	(4)	(4)
rectangle	(2)	2
parallelogram	0	2
irr. quad.	0	1
kite	1 (horizontal)	1
rhombus	2 (diagonals)	2
trapezium	0	1

- d) i)  ii) 1
e) 8
f) 8

ISS5 Area

- a) self checks
b) self check
c) i) Parallelogram, Triangle
ii) Triangle $= (3 \times 1.5) = 4.5 \text{ cm}^2$
Parallelogram $= (\frac{1}{2} \times 2.5 \times 1) = 1.25 \text{ cm}^2$
iii) $4.5 \text{ cm}^2 + 1.25 \text{ cm}^2 = 5.75 \text{ cm}^2$ as required

ISS6 Circles

- a) self check
b) 3.141592654
c) Circumference $= 31.415... = 31.4 \text{ cm}$ 3sf
(or 31.42 cm or 31.4 cm 3sf using $\pi = 3.142$)
Area $= 78.539... = 78.5 \text{ cm}^2$ 3sf
(or 78.55 or 78.6 3sf using $\pi = 3.142$)
d) 5cm
e) Perimeter $= 17.853... = 17.8 \text{ cm}$ 3sf
(or 17.855 or 17.9 3sf using $\pi = 3.142$)
Area $= 19.634... = 19.6 \text{ cm}^2$ 3sf
(or 19.6375 or 19.6 cm^2 3sf using $\pi = 3.142$)

ISS7 Polygons

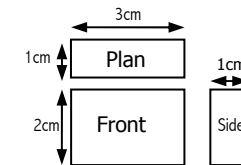
- a) i) 130°
ii) 140°
b) Hexagon: i) 60°
ii) 120°
10-sided: i) 36°
ii) 144°

ISS8 Polygons

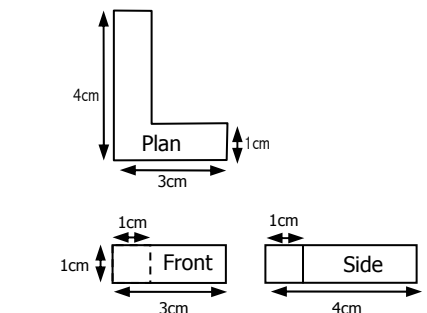
- a) self check
b) Marks at $0^\circ, 72^\circ, 144^\circ, 216^\circ$ and 288° to form a regular pentagon – self check

ISS9 Views

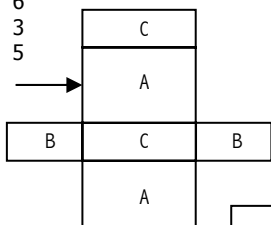
- a) half real size

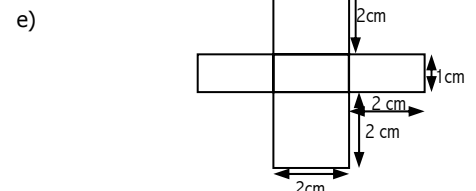


- b) half real size



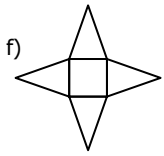
ISS10 Nets

- a) 6
b) 3
c) 5
d) 

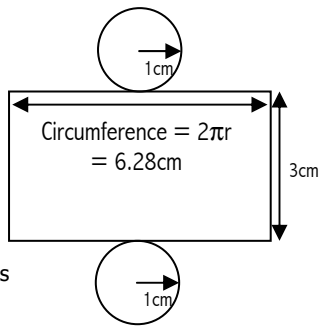


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iSS10 Nets cnt...



g)



iSS11 Explain Geometric Facts

a) self check – see iSS11

iSS11 cnt...

b) B and Z added also make 180° because angles on a straight line make 180° . Therefore Z must be equal to A and C.

c)

$$\hat{A}BC + \hat{B}AC + \hat{A}CB = 180^\circ \text{ angles in a triangle}$$

$$\hat{A}BX + \hat{A}CB = 180^\circ \text{ angles on a st line}$$

$$\text{So, } \hat{B}AC + \hat{A}CB = \hat{A}BX \text{ as required}$$

ANSWERS – Preliminary Course for Intermediate Students **YOUR TURN! Handling Data**

iHD1 Pie Charts

a) 3°

b) $360 \div 120 = 3^\circ$

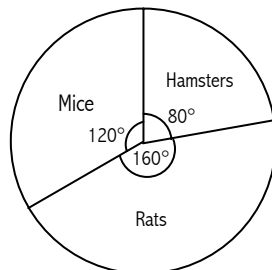
c)

Creature	Frequency	Angle in Pie Chart
Hamsters	10	80
Rats	20	160
Mice	15	120
Total	45	360

Creature	Frequency	Angle in Pie Chart
Insects	410	205
Birds	200	100
Reptiles	110	55
Total	720	360

ii)

Title, "Pie Chart showing..."



iHD2 Stem & Leaf Diagrams

a)

0	1	1	1	1	1	1
2	0	0	1	1		
4	0	1	1			
6	1					
8	1					
10	1					
12	0					

Key: 2 | 1 means $2 + 1 = 3$

b)

0	3	4	4	5	7	9
10	2	7				
20	1					
30	0					
40	1	7	7	8	8	9

Key: 10 | 2 means $10 + 2 = 12$

c) i) not equally spaced (i.e. needs to be 0 not 1)

ii) only two stems have **leaves** (numbers)

d) $24 - 3 = 21$

iHD3 Probabilities

a) $\frac{3}{10}$

b) 0.65

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iNA1 Ordering

- a) 0.098, 0.2, 0.789, 0.98
b) -11, -6, -5, 2, 3

iNA2 Place Value

- 12700
- 1.27
- 0.00127
- a) 39483000
b) 39.483
c) 394830

iNA3 Rounding

- a) 15970
b) 16000
c) 16000

iNA4 Estimation

- a) 90000
b) 20

iNA5 Reversing

- 266 (×3, +5)
- 12 (11 additional + first hour!)
- 12.3

iNA6 Exchange Rates

- a) €451.35
b) £1100

iNA7 Value/Ratio

- Jar 3 is BEST
Jar 1 is WORST
- £6.60 or (£6.6)

iNA8 BODMAS

- 18
- a) $(1 + 2) \times 4 - 3 = 9$
b) $1 + 2 \times (4 - 3) = 3$

iNA9 Index Form

- a) 9
b) 5
c) 8
d) 987
e) 65536

- $2^3 \times 3^2$ (or $2^3 \times 3^2$)

iNA10 Fraction/Decimals

- 0.1375
- $\frac{11}{25}$
- $\frac{3}{10}$ (terminates)

iNA11 Fraction/Decimals/%

- a) 55%
b) 0.07
c) 8.75%
d) $\frac{7}{25}$

iNA12 Fraction X/Y

- $\frac{5}{7}$

iNA13 Fraction/% of Amounts

- £66
- $68\frac{4}{11} \text{ cm}$

iNA14 Order Fractions

- $\frac{1}{5}, \frac{3}{8}, \frac{4}{9}, \frac{1}{2}$
- $\frac{55}{90}$ (or $\frac{11}{18}$) or other correct answer

iNA15 Simplify Expressions

- a) $3f - 6$
b) $6ghk$ (letters in any order)

iNA16 Substitutions

- a) -3
b) 36

iNA17 Algebra

- $12x - 5$
- $12, 2n + 4$

iNA18 Coordinates

- A(-4, 3), B(2, 0), C(0, -3)
- (1, -1.5)

iSS1 Angle Calculations

- a = 60° F-angle
b = 60° Z-angle
c = 125° C-angle
d = 55° F-angle
e = 65° Angles in a triangle

iSS2 Quadrilaterals

- Rectangle, Parallelogram ONLY
- All (4) sides equal, Opposite angles equal, Two pairs of parallel sides

iSS3

- a) 4.5 litres
b) 2.5 cm

iSS4 Symmetry

- i) ii)
a) 4 4
b) 2 2
c) 1 1
d) 0 2
e) 5 5

iSS5 Area

- A = 2cm^2
B = 4.5cm^2

iSS6 Circles

- i) C = 75.398... = 75.4cm 3sf
(or 75.408, 75.4cm 3sf using $\pi = 3.142$)
ii) Area = 452.38... = 452cm² 3sf
(or 452.44(8), 452.4cm² 3sf using $\pi = 3.142$)
iii) Perimeter = 61.699... = 61.7cm 3sf
(or 61.704, 61.7 cm 3sf using $\pi = 3.142$)
Area = 226.19... = 226cm² 3sf
(or 226.22(4), 226cm² 3sf using $\pi = 3.142$)

iSS7 Polygons

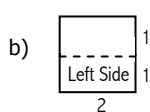
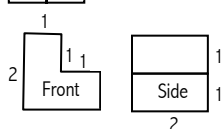
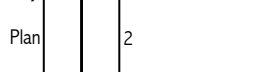
- i) 140°
ii) 170°
- a) 40°
b) 140°

iSS8 Polygons

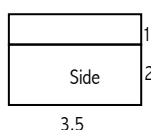
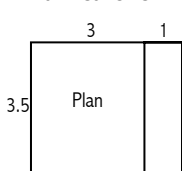
- self check, see iSS8
- Marks at 0°, 36°, 72°, 108°, 144°, 180°, 216°, 252°, 288°, and 324° to form a regular 10 sided polygon – self check, see iSS8

iSS9 Views

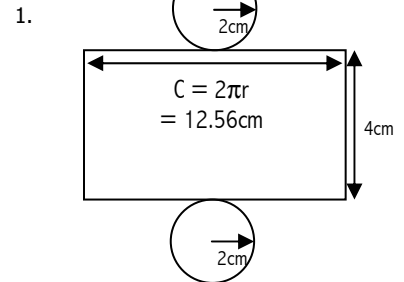
- a) half real size



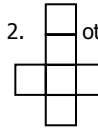
- half real size



iSS10 Nets



- other nets are possible!



iSS11 Explain Geometric Facts

- A = D, Z-angles; B = E, Z-angles;
 $C + D + E = 180^\circ$ because angles on a straight line sum to 180°. Replacing A for D and B for E gives, $A + B + C = 180^\circ$ as required.
- self check see explanation in iSS11

iHD1 Pie Charts

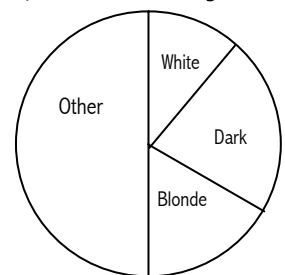
- a) i)

Car Colour	Frequency	Angle in Pie Chart
Red	5	40
Green	25	200
Blue	15	120
Total	45	360

- ii)

Hair Colour	Frequency	Angle in Pie Chart
White	10	40
Dark	20	80
Blonde	15	60
Other	45	180
Total	90	360

- b) Title, "Pie Chart showing..."



iHD2 Stem & Leaf Diagrams

- | | | | |
|----|---|---|---|
| 0 | 1 | 2 | 2 |
| 5 | 0 | 4 | |
| 10 | 1 | 3 | |
| 15 | 0 | 4 | 4 |

Key: 10 | 1 means 10 + 1 = 11
or equivalent key.

Median is 10 (average of middle values 9 & 11 is $\frac{9+11}{2} = 10$)

iHD3 Probabilities

- a) $\frac{11}{360}$
b) $\frac{349}{360}$
- $\frac{2}{7}$
- 0.1