SECTION 1 **ALGEBRA** 70 marks)

Q.1 Write the algebraic expression for:

(i) the sum of p and q $p+q$ 1

(ii) the difference between a and b $a-b$ 1

(iii) the product of r and t rt 1

(iv) the quotient of g and h $\frac{g}{h}$ 1

[4]

Q.2 Write each statement as an algebraic expression:

(i) double y less 4 $2y-4$ 1

(ii) 8 decreased by b $8-b$ 1

(iii) double the sum of x and y $2(x+y)$ 1

(iv) the square of p less 7 p^2-7 1

(v) m squared plus double p m^2+2p 1

[5]

Q.3 Write an algebraic expression for the cost of 6 pies at \$$y$ each. $6y$ 1

Q.4 A barn contains 4 cows, 3 horses and 8 chickens.

How many legs in the barn altogether?

$4\times4+3\times4+8\times2 = 16+12+16$

$= 44$ [2]

1 1

Q.5 If $x = 2$ and $y = -3$ evaluate each of the following expressions:

(i) $2x + 3y$ $2\times2+3\times-3$ 1

$= 4-9 = -5$ 1 (2)

(ii) $4xy$ $4\times2\times-3 = -24$ (1)

(iii) $6xy^2$ $6\times2\times(-3)^2$ 1

$= 12\times9$

$= 108$ 1 (2)

[2+1+2]

Q.6 Simplify each of the following:

(i) $8y - 6y$ $2y$ 1

(ii) $-2x - x$ $-3x$ 1

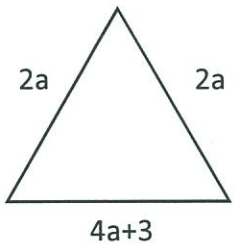
(iii) $7a - 3b + a - 8b$ $8a-11b$ 1

(iv) $4y^2 - 5y + 3y^2$ $7y^2-5y$ 1

[4]

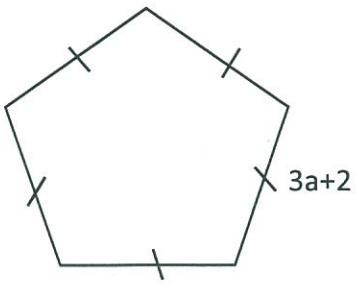
Q.7 Write an algebraic expression for the perimeter of each shape in simplest form:

(i)



$P = 8a+3$ (2)

(ii)



(2)

$P = 5(3a+2) = 15a+10$

[2+2]

Q.8 Simplify each algebraic expression:

(i) $2 \times 4m$ $8m$ 1

(ii) $3x \times 4y$ $12xy$ 1

(iii) $-5y \times 2p$ $-10py$ 1

(iv) $-4xy \times (-3y)$ $12xy^2$ 2

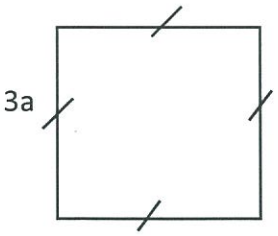
(v) $4m \times 3m^2$ $12m^3$ 2

(vi) $4ab \times (-3a) \times (-2b)$ $24a^2b^2$ 2

[1+1+1+2+2+2] 9

Q.9 Find an algebraic expression for the area of each shape:

(i)

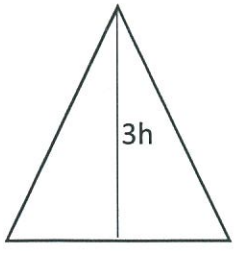


$A = 3a \times 3a$ 1

$= 9a^2$ 1

2

(ii)



$A = \frac{1}{2} \times 6b \times 3h$ 1

$= 9bh$ 1

2

[2+2]

Q.10 Simplify each quotient:

(i) $\frac{8f}{4}$ $2f$ 1

(ii) $12b \div (-3)$ $-4b$ 1

(iii) $\frac{16ab}{-4a}$ $-4b$ 2

(iv) $\frac{32x^3y^4}{4xy}$ $8x^2y^3$ 2

[1+1+2+2]

Q.11 Simplify each expression using the order of operations:

(i) $14 + 2y \times 6$ $14+12y$ 1

(ii) $12m - 8m \div 2$ $12m - 4m = 8m$ 2

(iii) $54y \div 6 - 3 \times 2y$ $9y - 6y = 3y$ 2

[1+2+2]

Q.12 Expand each of the following:

(i) $3(x + 4)$ $3x+12$ 1

(ii) $4m(m - 2)$ $4m^2 - 8m$ 2

(iii) $-8(5 - 3m)$ $-40 + 24m$ 2

[1+2+2]

Q.13 Expand and simplify:

(i) $2(x - 4) + 4(x - 3)$

$2x - 8 + 4x - 12$ 1

$= 6x - 20$ 1

2

(ii) $5(2a + 6) - 2(3a - 8)$

$10a + 30 - 6a + 16$ 2

$= 4a + 46$ 1

3

[2+3]

Q.14 Find the highest common factor for each pair of terms:

(i) $8y$ *and* $12y$ 4y 1

(ii) $6j$ *and* $8k$ 2 1

(iii) $12m$ *and* $4mn$ 4m 1

(iv) $12a^2$ *and* $18ab$ 6a 1

[4]

Q.15 Factorise each expression:

(i) $3a + 9$ $= 3(a+3)$ 1

(ii) $xy + yz$ $= y(x+z)$ 1

(iii) $8p - 24s$ $= 8(p-3s)$ 1

(iv) $-2a - 14$ $= -2(a+7)$ 1

(v) $-20k + 25$ $= -5(4k-5)$ 1

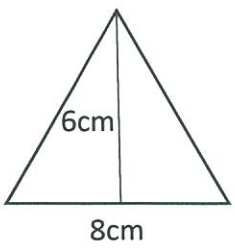
(vi) $-6xy - 42y^2$ $= -6y(x+7y)$ 2

[1+1+1+1+1+2]

SECTION 2 **AREA AND VOLUME (24 marks)**

Q.1 Find the area of each of the following shapes:

(i)



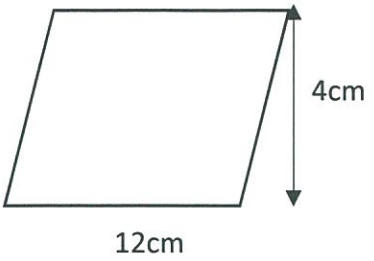
$A = \frac{1}{2} \times 8 \times 6$

$= 24\ cm^2$

1

[1]

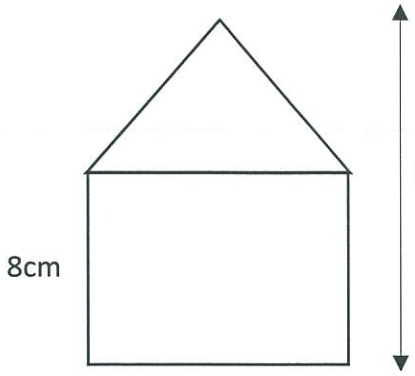
(ii)



1

$A = 12 \times 4 = 48\ cm^2$ [1]

(iii)



$14 - 8 = 6$

$A = 8 \times 12 + \frac{1}{2} \times 12 \times 6$ 1

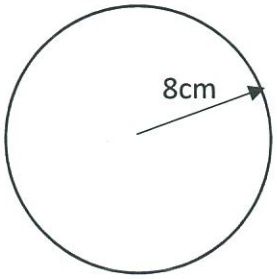
$= 96 + 36$ 1

$= 132\ cm^2$ 1

3

[3]

(iv)



$A = \pi r^2$

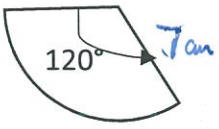
$= \pi \times 8^2$

$= 201.1\ cm^2$

1

[1]

(v)



$A = \frac{120°}{360°} \times \pi r^2$ 1

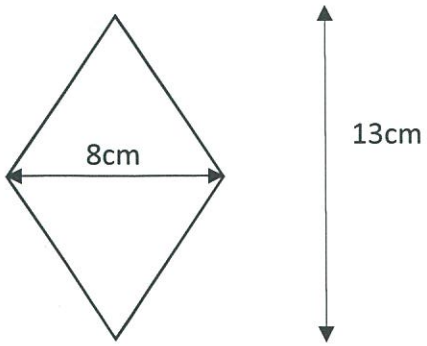
$= \frac{1}{3} \times \pi \times 7^2 = 51.3\ cm^2$ 1

2

[2]

Q.1 (continued)

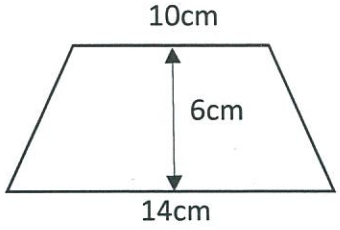
(vi)



$A = \frac{1}{2} \times 8 \times 13 = 52\ cm^2$ (1)

[1]

(vii)

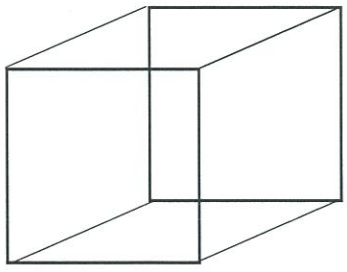


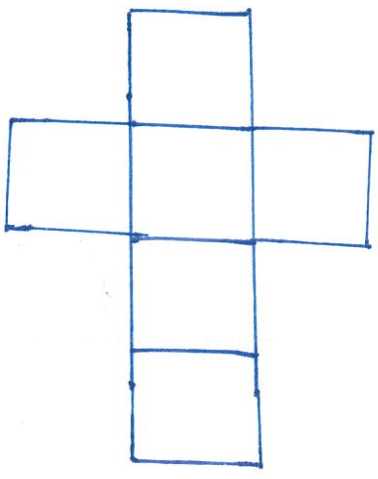
$A = \left(\frac{10+14}{2}\right) \times 6$ 1 (2)

$= 12 \times 6 = 72\ cm^2$ 1 [2]

Q.2 Draw the net for each of the following solids:

(i)

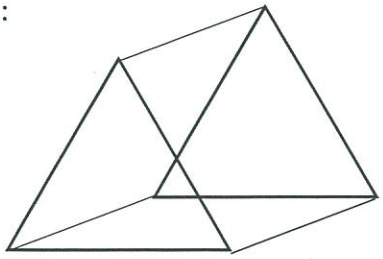




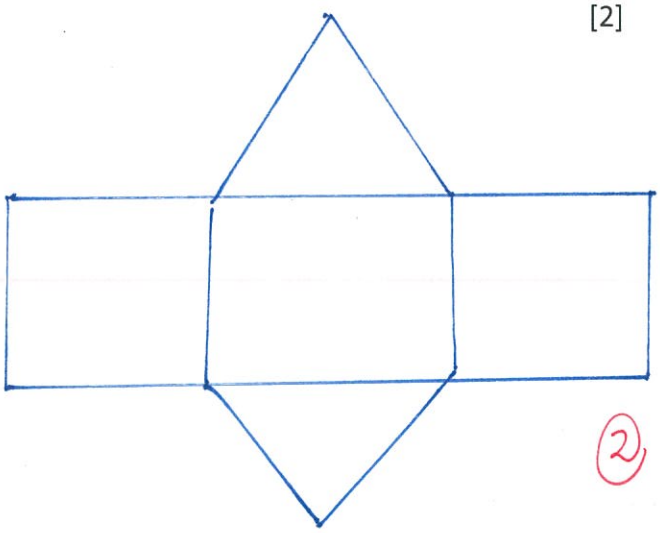
(2)

[2]

(ii) :



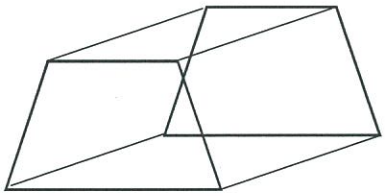
[2]



(2)

Q.3 Draw the shape of the uniform cross section for each of the following prisms:

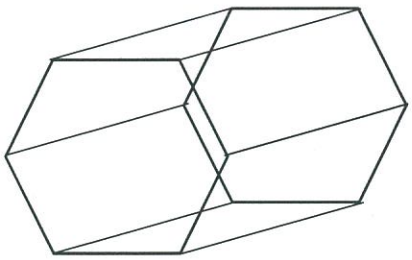
(i)



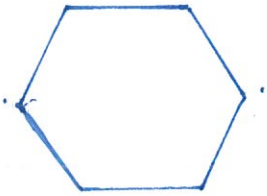
(1)

[1]

(ii)



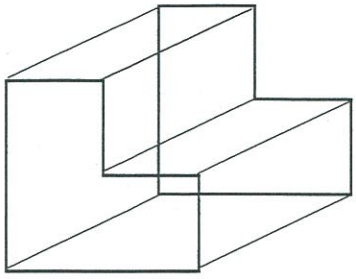
(1)

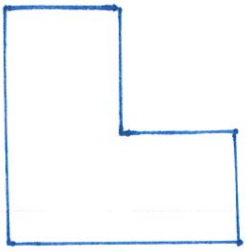


[1]

Q.3 (continued)

(iii)

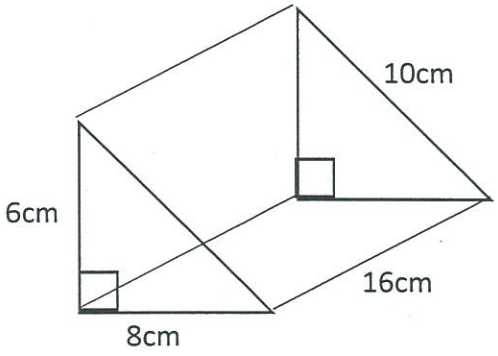




(1)

[1]

Q.4 Find the surface area of the following prism.



S.A. = $2 \times \frac{1}{2} \times 8 \times 6$ 1

$+ 10 \times 16 + 8 \times 16 + 6 \times 16$

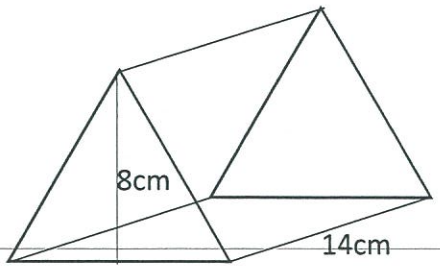
$= 48 + 160 + 128 + 96$ 1

$= 432 \text{ cm}^2$ 1

(3)

[3]

Q.5 Find the volume of the following prism:



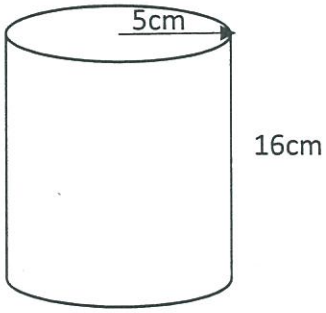
10cm

$V = \frac{1}{2} \times 10 \times 8 \times 14$ 1

$= 560 \text{ cm}^3$ 1 (2)

[2]

Q.6 Find the volume of the following cylinder:



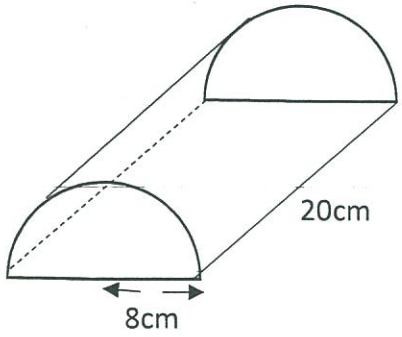
$V = \pi r^2 h$

$= \pi \times 5^2 \times 16$ 1

$= 1256.64 \text{ cm}^3$ 1 (2)

[2]

Q.7* Find the surface area of the following solid.



S.A. = $\pi \times 8^2$ + 16×20 + $\frac{1}{2} \times 2\pi \times 8 \times 20$ 1 1 1

ends base curved surface

= 1023.72 cm^2 1

4

[4]

END OF TEST