Multiple-choice section

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Question | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| Answer | B | A | D | C | D | B | B | A | D | C |

Question 1 [4.1]

B

*P* = 2*l* + 2*w*

= 2 × 2.3 + 2 × 1.8

= 4.6 + 3.6

= 8.2 m

Question 2 [4.1]

A

arc length = × 2πr

=× 2 × π × 21

= 43.98 cm

Question 3 [4.1]

D

*P =* + 2 × 5.7

= 11 + 11.4

= 22.40 cm

Question 4 [4.2]

C

35 500 mm2 = 35 500 ÷ 1000 cm2 = 0.0355 cm2

Question 5 [4.2]

D

*A* = π*r*2

= π × 32

= 14.14 cm2

Question 6 [4.2]

B

*A* = *l*2 – π*r*2

= (18 × 18) – (π × 92)

Question 7 [4.3]

B

SA = 2πr*2* + 2π*rh*

= 2 × π × 82 + 2 × π × 8 × 10

Question 8 [4.3]

A

SA = 4 × *bh* + *b*2

= 2*bh* + *b*2

= 2 × 12 × 18 + 122

= 432 + 144

= 576 cm2

Question 9 [4.4]

D

74 400 cm3 = 74 400 ÷ 1000 L = 74.4 L

Question 10 [4.4]

C

*V* = *AH*

=  × 12 × 5 × 20 m3

Multiple-choice total marks: 10

Short answer section

Question 11 4 marks [4.1]

(a) *P* = (21 + 18) × 2

= 78 cm

**(b)** 

Question 12 4 marks [4.1, 4.2]

*P* =  × 2 × π × (21 + 14) +  × 2 × π × 14 + 2 × 21

*P* = 144.63

*A* = × (π*R*2 – π*r*2); *R* = 35 cm, *r* = 14 cm

*A* =  × (π × 352 – π × 142)

*A* = 1077.57 cm2

Question 13 2 marks [4.1]

possible combinations of dimensions are:

3 balls by 4 balls

= 6*r* by 8*r*

= 30 cm by 40 cm

perimeter = 140 cm

2 balls by 6 balls

= 4*r* by 12*r*

= 20 cm by 60 cm

perimeter = 160 cm

1 ball by 12 balls

= 2*r* by 24*r*

= 10 cm by 120 cm

perimeter = 260 cm

Smallest possible dimensions are 4 balls by 3 balls.

Smallest perimeter is 140 cm.

Question 14 3 marks [4.2]

(a) 6.5 × 10002 = 6 500 000 mm2

(b) 0.25 ha × 1002 = 2500 m2

(c) 8 950 000 cm2 ÷ 1002 ÷ 1002 = 0.0895 ha

Question 15 6 marks [4.2]

**(a)** shaded area = *l*2 – 4π*r*2

= 242 – 

= 123.61 cm2

**(b)** *A* = 4 ×× *xy*

= 2 × 3.75 × 2.4

= 18 m2

Question 16 4 marks [4.3]

(a) SA = 

= 48 + 120 + 160 + 200

= 528 cm2

(b) SA = 2 × = 6374.34 cm2

Question 17 4 marks [4.4]

(a) *V* = (× π*r*2 + *lw*) × *H*

= (× π × 42 + 16 × 8) × 20

= 3062.65 cm3

*C* = 3062.65 ml

= 3062.65 ÷ 1000 L

= 3.06 L

(b) *V* = (× π*r*2) × *H*

= (× π × 822) × 150

= 792 152.59 cm3

*C* = 792 152.59 ml

= 792 152.59 ÷ 1000 L

= 792.15 L

Question 18 3 marks [4.4]

*V* = *AH*

= (π*R*2 – π*r*2) × *H*

*R* = 2.1 m, *r* = 1.8 m

*V* = (π × 2.12 – π × 1.82) × 9.3 = 34.18 m3

Short answer total marks: 30

Extended answer section

Question 19 1 + 2 + 3 marks [4.1, 4.2, 4.3]

(a) 360° ÷ 12 = 30°

(b) 

(c) 

Question 20 3 + 3 + 1 + 2 + 2 marks [4.4]

(a) 

wheelbarrow volume = 90 000 cm3÷ 1003= 0.09 m3

(b) 

(c) number of trips = 86.5 ÷ 0.09 = 961.11 (962 trips)

(d) volume of tip truck = 8 × 1.8 × 3.8 = 54.72 m3; number of trips = 86.5 ÷ 54.72 = 1.58 (2 trips)

**(e)** volume of water = 86.5 – (14.5 × 5 × 0.1) = 79.25 m3 or 79 250 L

Extended answer total marks: 17

TOTAL test marks: 57