Multiple-choice section

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Question | 1 | 2 | 3 | 4 | 5 |
| Answer | C | A | B | D | A |

Question 1 [11.1]

C

5.3 = ,  = 11 = , ,  = 5 =  are all rational.

Question 2 [11.1]

A

 is between  and , so  is between 3 and 4.

Question 3 [11.2]

B

 = 

= 3

Question 4 [11.2]

D

3 × 7

= 3 × 7 ×  × 

= 

Question 5 [11.3]

A

Collecting like terms:  
11 − 6 = 5

Multiple-choice total marks: 5

Short answer section

Question 6 2 marks [11.1]

 is an example of a surd or an irrational number.

Question 7 3 marks [11.3]

 + 4

= **** +4 × ****

= 3**** +4 × ****

Question 8 4 marks [11.4]

5(3+)

= 5 × 3+5×

=15**** +5

=15 × 4+5

=60+5 × 

= 60 + 10

Question 9 2 marks [11.2]

4 =  × 

= 

= 

Question 10 3 marks [11.3]

*A* = πr2  
= π × 5 × 5  
= 25 × 7 × π  
= 175π mm2

Question 11 5 marks [11.5]

|  |  |
| --- | --- |
| (a)  =  = 3 | (b)  =  ×  = 3 |

Short answer total marks: 19

Extended answer section

Question 12 8 marks [11.2, 11.3]

**(a)** *r* = ( + 4) cm  
*A* = π*r*2  
= π × ( + 4)2 cm2  
= π × (3 + 8 + 16) cm2  
= (19 + 8)π cm2

**(b)** Curved surface length:  
*C* = 2π*r*  
= 2π( + 4) cm  
Area of curved surface:  
*A* = 2π( + 4) × 5 cm2  
= 10π( + 4) cm2SA = area of curved surface + 2 × area of base  
= 10π( + 4) + 2 × (19 + 8) cm2  
= π(10 + 40 + 38 + 16) cm2  
= (26 + 78) π cm2

**(c)** Volume = area of base × height  
*V* = (19 + 8)π × 5 cm3  
= 5π(19 + 8) cm3

Question 13 8 marks [11.2, 11.3]

**(a)** Exact wall height= 2 × 15 + 2 × 100 cm  
= (30 + 200) cm

**(b)** Exact width of the wall  
= 2 × 15 + 2 × 200 cm  
= (30 + 400) cm

**(c)** *A* = (30 + 200)(30 + 400) cm2  
= 900 × 5 + 12 000 + 6000 + 80 000 cm2  
= 84 500 + 18 000 cm2

**(d)** *A* = 84 500 + 18 000 – π(15)2 cm2  
= 84 500 + 18 000 – 1125π cm2= 121 214.931… cm2

= 12.12 m2 (2 d.p.)

Extended answer total marks: 16

TOTAL test marks: 40