Fully-worked Solutions

Practice 7

Formative Practice

1

8 cm
6 cm

Answer: **C**

2 (a)

(b)

(c)

(d)

3 (a)   (b)

4 (a)   (b)

5 (a)

(b)

2 cm
2 cm
1 cm
4 cm

6

1 cm
2 cm
4 cm

7 (a)

4 cm
4 cm
2 cm
4 cm

(b)

1 cm   2 cm   1 cm
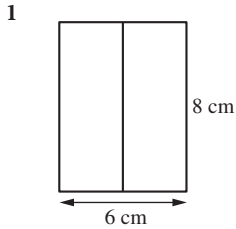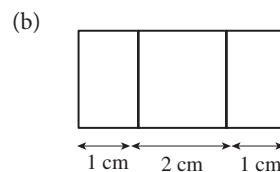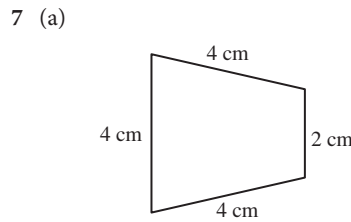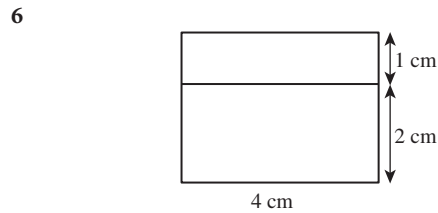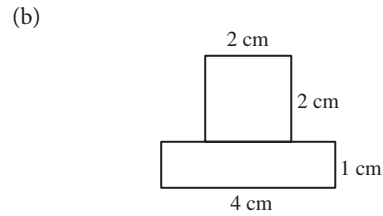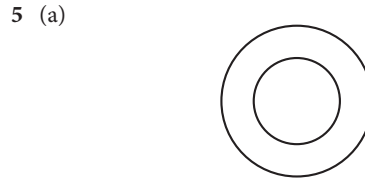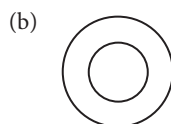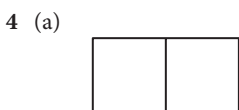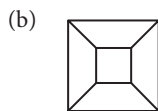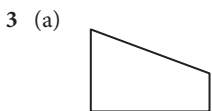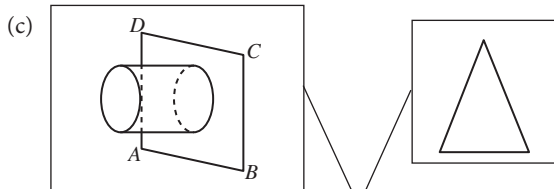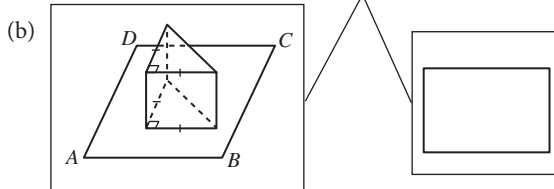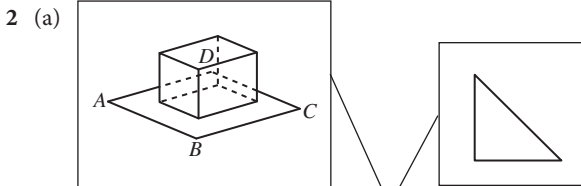
8 (a) The length *AB* on the object and its orthogonal projection are the same. ✓

(b) The length *BF* on the object and its orthogonal projection are the same. ✗

(c) The angle *AEB* on the object and its orthogonal projection are different. ✗

(d) The angle *DBF* on the object and its orthogonal projection are different. ✓
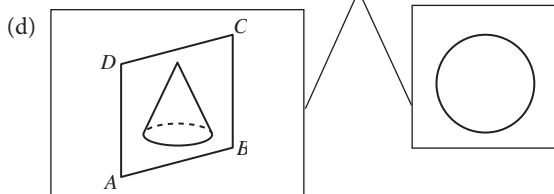
(e) The shape *ABE* on the object and its orthogonal projection are the same. ✓

9 (a) The sides that are of the same length on the object and its orthogonal projection are *PQ, PS, QR* and *RS.*
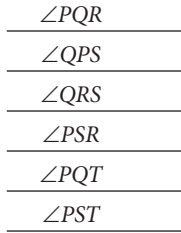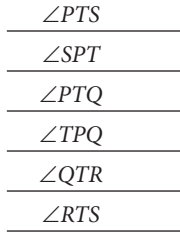
(b)

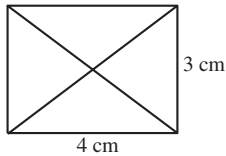Angle corresponding on the object and its orthogonal projection

(i) Same
- ∠*PQR*
- ∠*QPS*
- ∠*QRS*
- ∠*PSR*
- ∠*PQT*
- ∠*PST*

(ii) Different
- ∠*PTS*
- ∠*SPT*
- ∠*PTQ*
- ∠*TPQ*
- ∠*QTR*
- ∠*RTS*

(c) (i) The shape *PQRS* on the object and its orthogonal projection are the same.
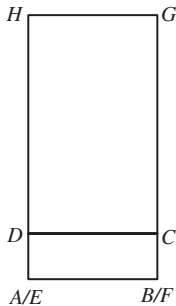
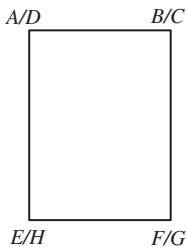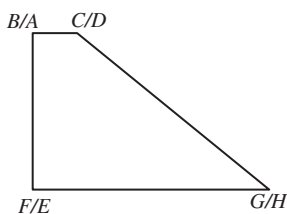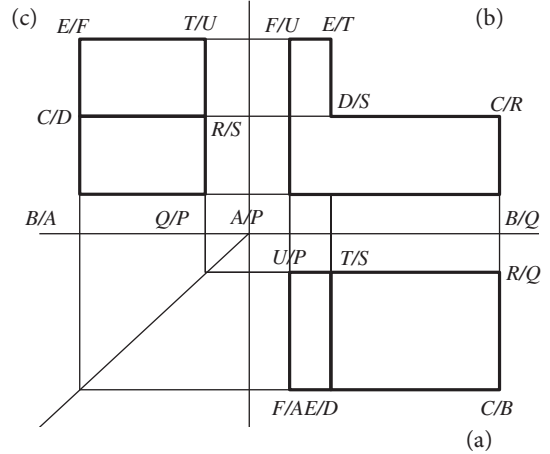(ii) The shape *PST* on the object and its orthogonal projection are different.

10

3 cm

4 cm

Answer: **D**

11 (a)

H G

D C

A/E B/F

(b) (i)

A/D B/C

E/H F/G

(ii)

B/A C/D

F/E G/H

12

(c)

E/F T/U F/U E/T (b)

C/D R/S D/S C/R

B/A Q/P A/P B/Q

U/P T/S R/Q

F/AE/D C/B

(a)

13

(c)

M N M/N (b)

J/K G/H C/J/G

C/D D/K/H

B/A B/F

F/E A/E

H N G F

K

M J

D/A C B

(a)

14 (a)

H

12 m

D G

E 21 m

9 m C

A F

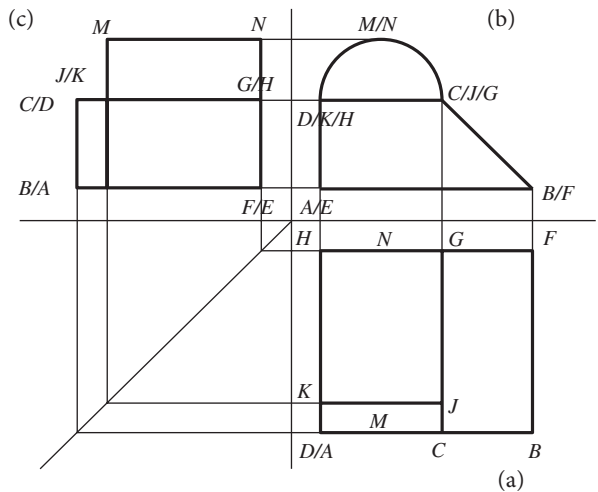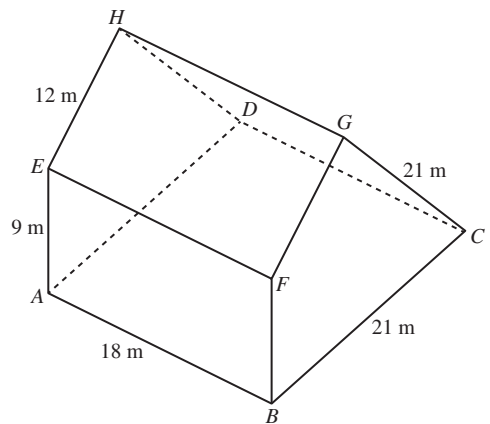18 m 21 m

B

(b) Surface area

$$= 18 \times 9 + 2 \times \left[\frac{1}{2} \times (9 + 16.8) \times 9 + \frac{1}{2} \times 12 \times 16.8\right]$$
$$+ 18 \times 21 + 18 \times 12$$
$$= 162 + 2 \times [116.1 + 100.8] + 378 + 216$$
$$= 433.8 + 756$$
$$= 1\,189.8 \text{ m}^2$$

Cost required
= 1 189.8 × RM14
= RM16 657.2
≈ RM16 700 (three significant figures)

Summative Practice

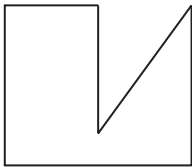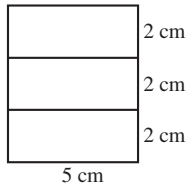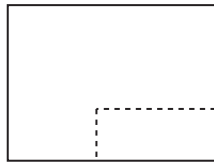**1** The size of angle *PTU* on the solid is the same as its orthogonal projection.
Answer: **C**

2
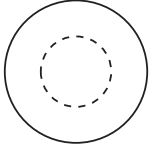
Answer: **B**

3

Answer: **D**

4 Orthogonal projection on a vertical plane as viewed from *R*

2 cm
2 cm
2 cm
5 cm

Answer: **C**

5

Answer: **A**

6 (a) (i)

W/S   *V/R*
T/P   *U/Q*

(ii)

T/W   *U*   *V*
P/S   *Q*   *R*
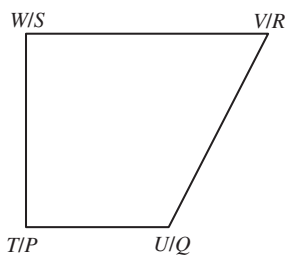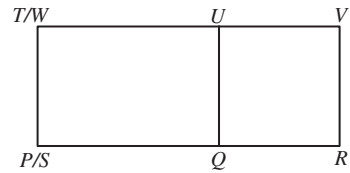
(b) (i) The length *VW* on the solid and its orthogonal projection on the horizontal plane is the same.
(ii) The angle *UVW* on the solid and its orthogonal projection on the horizontal plane is the same.
(iii) The shape *TUVW* on the solid and its orthogonal projection on the horizontal plane is the same.

(c) (i) The length *UV* on the solid and its orthogonal projection on the horizontal plane is different.
(ii) The angle *PTU* on the solid and its orthogonal projection on the horizontal plane is the same.
(iii) The shape *QRVU* on the solid and its orthogonal projection on the horizontal plane is different.
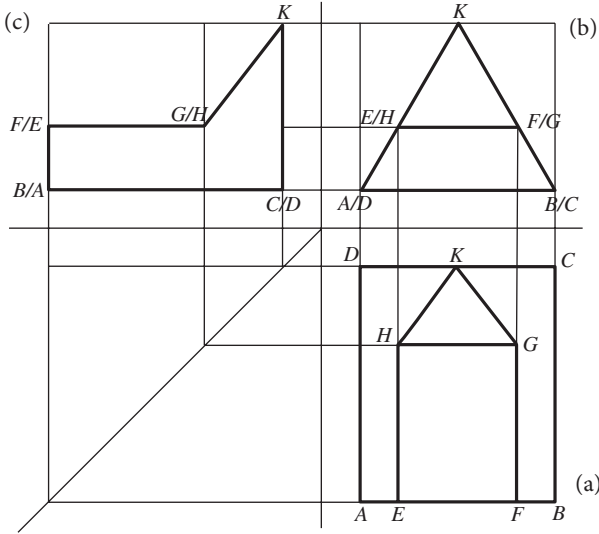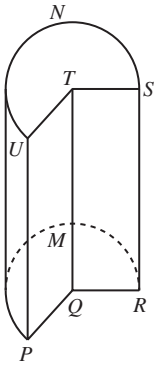
7

(b)   (c)

(a)

8

(c)

(b)

(a)
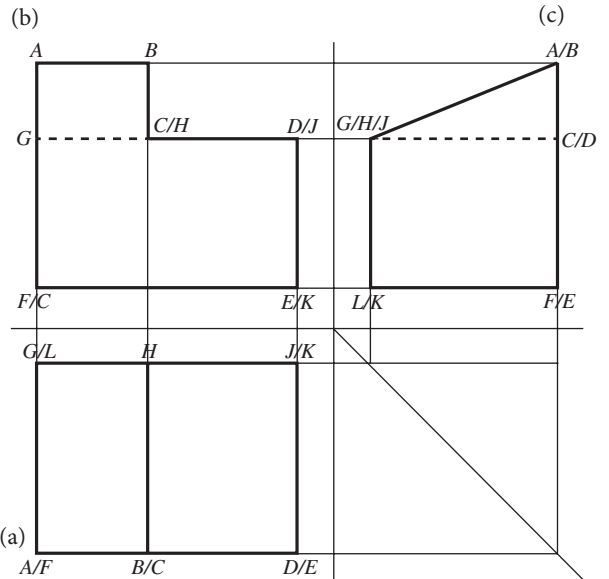
9 (a)

(b) Angle $PQR = 106°$

(c) Reflex angle PQR
   $= 360° - 106°$
   $= 254°$
   Volume of solid
   $= \dfrac{254°}{360°} \times \dfrac{22}{7} \times 10^2 \times 28$
   $= 6\ 210\ \text{cm}^3$

10

(b)

(c)

(a)