

FORMULAS FOR REFERENCE

SPHERE	Surface area	$= 4\pi r^2$
	Volume	$= \frac{4}{3}\pi r^3$
CYLINDER	Area of curved surface	$= 2\pi rh$
	Volume	$= \pi r^2 h$
CONE	Area of curved surface	$= \pi rl$
	Volume	$= \frac{1}{3}\pi r^2 h$
PRISM	Volume	$= \text{base area} \times \text{height}$
PYRAMID	Volume	$= \frac{1}{3} \times \text{base area} \times \text{height}$

SECTION A(1) (33 marks)**Answer ALL questions in this section and write your answers in the spaces provided.**

1. Make m the subject of the formula $mx = 2(m + c)$. (3 marks)

2. Find the range of values of x which satisfy both $\frac{3-5x}{4} \geq 2-x$ and $x+8 > 0$. (3 marks)

3. Factorize

(a) $x^2 - (y - z)^2$,

(b) $ab - ad - bc + cd$.

(3 marks)

11. (a) For the set of data 10, 10, 11, 12, 13, 16, find

- (i) the mode,
- (ii) the median,
- (iii) the mean,
- (iv) the range.

(4 marks)

(b) Four unknown data are combined with the six data in (a) to form a set of ten data.

- (i) Find the least and the greatest possible values of the median of the combined set of ten data.
 - (ii) If the mean of the four unknown data is 11, find the mean of the combined set of ten data.
- (4 marks)

SECTION B (33 marks)

Answer any **THREE** questions in this section and write your answers in the spaces provided. Each question carries **11** marks.

14.

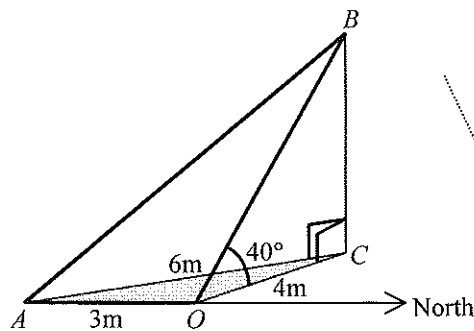


Figure 5(a)

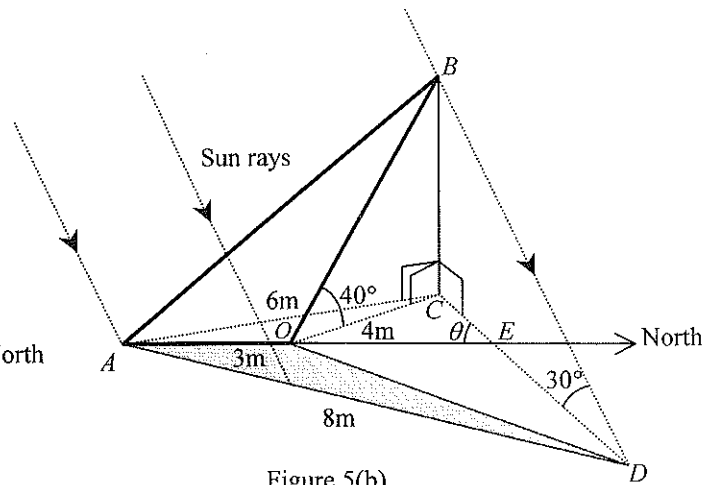


Figure 5(b)

Figure 5(a) shows a triangular metal plate OAB standing on the horizontal ground. The side OA lies along the north-south direction on the ground. OB is inclined at an angle of 40° to the horizontal. The overhead sun casts a shadow of the plate, OAC , on the ground. $OA = 3\text{ m}$, $OC = 4\text{ m}$ and $AC = 6\text{ m}$.

- (a) Find $\angle OAC$. (2 marks)
- (b) In Figure 5(b), OAD is the shadow of the plate cast on the horizontal ground when the sun shines from $S\theta W$ with an angle of elevation 30° . AO is produced to cut CD at E . $AD = 8\text{ m}$.
- (i) Find CD .
- (ii) Find $\angle CAD$.
- (iii) Using $CE + ED = CD$, or otherwise, find θ .

(9 marks)

16. John will participate in a contest to be held at a university. If John wins the contest, he will go to Canteen X for lunch. Otherwise, he will go to Canteen Y . The following table shows the types of set lunches and the prices served in the two canteens. He will choose one type of set lunch randomly.

Canteen	Set lunch	Price (\$)
X	A	40
	B	50
Y	C	15
	D	20

- (a) If the probability of John winning the contest is $\frac{1}{10}$, find the probability that he will spend \$15 for lunch. (2 marks)
- (b) If John takes a bus leaving at 8:00 a.m. to the university, his probability of winning the contest will be $\frac{1}{10}$. If he misses the bus, he will take a train leaving at 8:20 a.m. Owing to his nervousness, his probability of winning will be reduced to $\frac{2}{25}$.
- (i) Suppose John misses the bus, find the probability that he will spend \$15 for lunch.
- (ii) The following table shows the cost of a single trip by bus or train:

Transportation	Cost of a single trip (\$)
Bus	4.5
Train	7.5

It is known that the probability of John taking the bus is twice that of taking the train.

- (1) Find the probability that John will spend \$15 for lunch after the contest.
- (2) If John goes home by train after lunch, find the probability that he will spend more than a total of \$30 for the lunch and the transportation of the two trips. (9 marks)
