

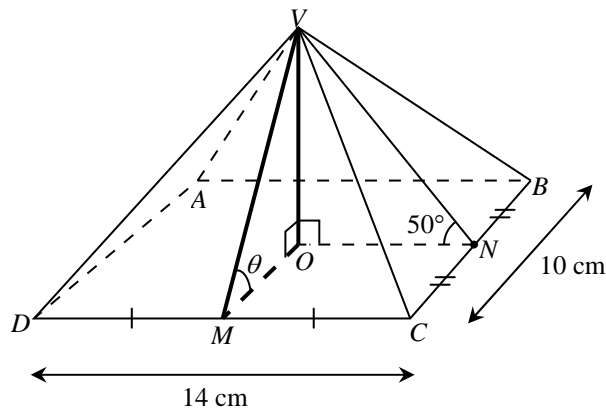


## CHAPTER 11: LINES AND PLANES IN 3-DIMENSIONS



Paper 2

### Solution to Question 24



$$ON = \frac{1}{2} \times 14 = 7 \text{ cm}$$

In triangle  $VON$ ,  $\frac{VO}{ON} = \tan 50^\circ$   
 $VO = 7 \tan 50^\circ$   
 $= 8.342 \text{ cm}$

$$MO = \frac{1}{2} \times 10 = 5 \text{ cm}$$

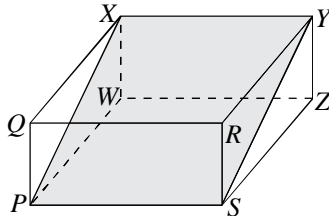
Thus, angle between the face  $VCD$  and the base  $ABCD = \theta$

$$\begin{aligned} \tan \theta &= \frac{VO}{MO} \\ &= \frac{8.342}{5} \\ &= 1.6684 \\ \theta &= 59^\circ 4' \end{aligned}$$

 **Paper 1**

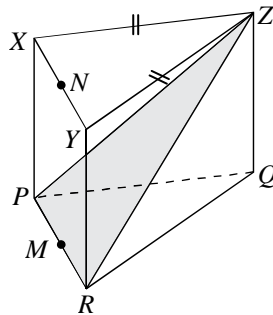
1. The diagram shows a cuboid with a horizontal base  $PSZW$ .

Clone  
SPM  
2006



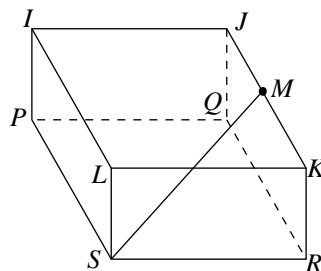
Name the angle between the plane  $PSYX$  and the plane  $PQRS$ .

- |          |              |          |              |
|----------|--------------|----------|--------------|
| <b>A</b> | $\angle RSY$ | <b>C</b> | $\angle RSQ$ |
| <b>B</b> | $\angle RSX$ | <b>D</b> | $\angle RSW$ |
2. The diagram shows a right prism with an isosceles triangle  $XYZ$  as its uniform cross section.  $M$  is the midpoint of  $PR$  and  $N$  is the midpoint of  $XY$ .



The angle between the plane  $PRZ$  and the plane  $PRYX$  is

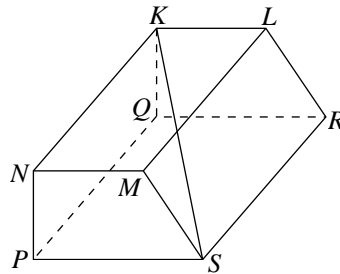
- |          |              |          |              |
|----------|--------------|----------|--------------|
| <b>A</b> | $\angle ZRN$ | <b>C</b> | $\angle ZMX$ |
| <b>B</b> | $\angle ZMN$ | <b>D</b> | $\angle ZMY$ |
3. The diagram shows a cuboid with a horizontal base  $PQRS$ .  $M$  is a point on the edge  $JK$  of the cuboid.



Name the angle between the line  $SM$  and the plane  $JKRQ$ .

- |          |              |          |              |
|----------|--------------|----------|--------------|
| <b>A</b> | $\angle SMR$ | <b>C</b> | $\angle SMQ$ |
| <b>B</b> | $\angle SMK$ | <b>D</b> | $\angle SMJ$ |

4. The diagram shows a right prism with a horizontal base  $PQRS$ . Trapezium  $PNMS$  is the uniform cross section of the prism.



Name the angle between the line  $KS$  and the plane  $PQKN$ .

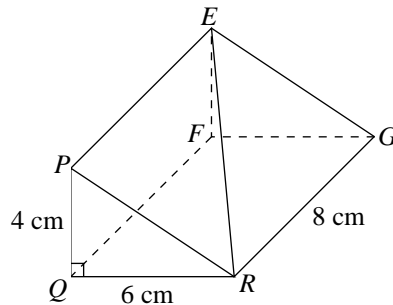
- |          |              |          |              |
|----------|--------------|----------|--------------|
| <b>A</b> | $\angle SKN$ | <b>C</b> | $\angle SKM$ |
| <b>B</b> | $\angle SKQ$ | <b>D</b> | $\angle SKP$ |



**Paper 2**

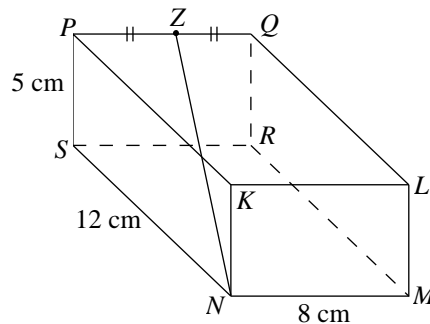
1. The diagram shows a right prism with a horizontal rectangular base  $FGRQ$ . The right-angled triangle  $PQR$  is the uniform cross section of the prism.

Clone  
SPM  
2006



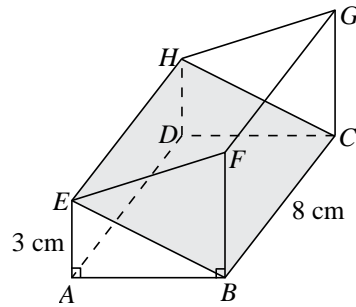
Identify and calculate the angle between the line  $ER$  and the base  $FGRQ$ .

2. The diagram shows a cuboid with a horizontal rectangular base  $MNSR$ .



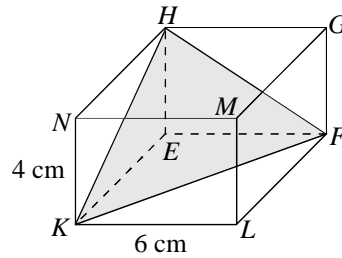
Identify and calculate the angle between the line  $ZN$  and the plane  $PSNK$ .

3. The diagram shows a right prism with a horizontal rectangular base  $ABCD$ . The trapezium  $ABFE$  is the uniform cross section of the prism and  $AC = 10$  cm.



Identify and calculate the angle between the plane  $BCHE$  and the plane  $BCGF$ .

4. The diagram shows a cuboid with a horizontal square base  $KLFE$ .



Calculate the angle between the plane  $HFK$  and the base  $KLFE$ .