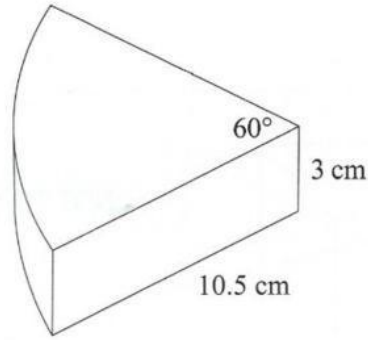


3. The diagram shows a slice of cake, cut from a large cylindrical shaped cake. The cake is of radius 10.5 cm and thickness of 3 cm. The cross-section of the slice is a sector of a circle making an angle of  $60^\circ$  at the centre.



NOT TO SCALE

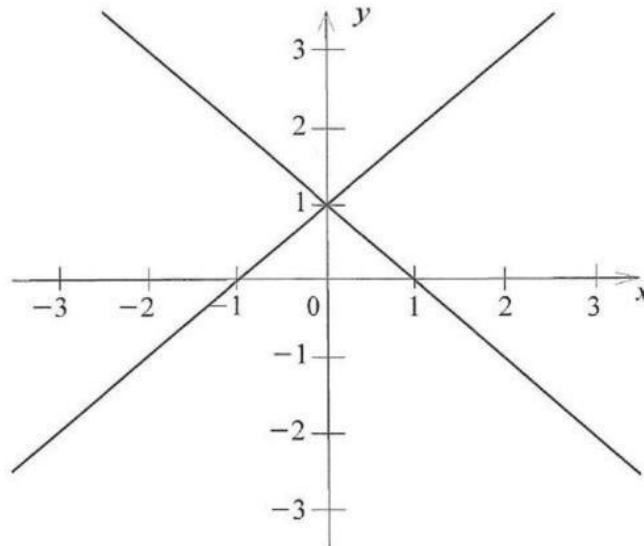
Taking  $\pi = \frac{22}{7}$ , calculate the volume of the slice of cake.

[3]

Area of Sector =  $\text{m}^2$

Area of Slice =  $\text{m}^3$

3.

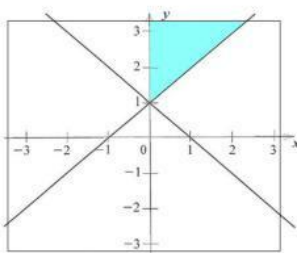


The diagram shows the graph of the two lines  $y = x + 1$  and  $y = 1 - x$ .

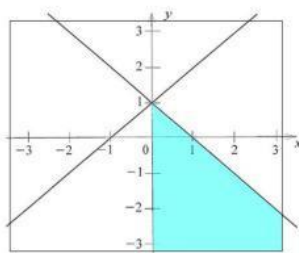
- (a) **Sketch** a copy of the diagram and label the graph of each line with its correct equation. [2]
- (b) On your diagram, shade the region for which the following three inequalities are satisfied.

$$\begin{cases} y \geq 0 \\ y \leq x + 1 \\ y \geq 1 - x \end{cases}$$

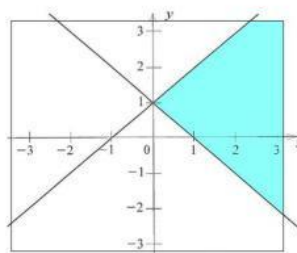
[3]



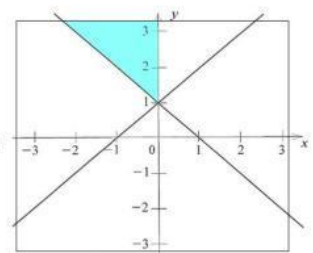
Option A



Option B



Option C



Option D

3. A straight-line graph passes through the points  $(-6,1)$  and  $(0,5)$ .

(a) Calculate the slope (gradient) of this line.

[2]

**Vertical Movement =**

**Horizontal Movement =**

**Slope =**

(b) Write down an equation for the graph of this line.

[1]

**y =      x +**

3. Given the matrix operation below, find the values of  $a$ ,  $b$  and  $c$ .

$$\begin{pmatrix} 3 & a \\ 2c & 7 \end{pmatrix} - \begin{pmatrix} 4 & 1 \\ c & -3 \end{pmatrix} = \begin{pmatrix} -1 & 5 \\ -8 & b \end{pmatrix}$$

[3]

**Equation involving a**

**=**

**a =**

**Equation involving b**

**=**

**b =**

**Equation involving c**

**=**

**c =**

3. Matrix  $A$  is defined as  $A = \begin{pmatrix} 4 & 6 \\ 3 & 5 \end{pmatrix}$ .

Find the following.

(a)  $A^2$   $\begin{pmatrix} \square & \square \\ \square & \square \end{pmatrix}$

[3]

(b)  $A^{-1}$   $\begin{pmatrix} \square & \square \\ \square & \square \end{pmatrix}$

[3]

3. Given that  $\vec{PQ} = \begin{pmatrix} -3 \\ 6 \end{pmatrix}$  and  $\vec{RQ} = \begin{pmatrix} 5 \\ -9 \end{pmatrix}$ , find  $|\vec{PR}|$ . [4]

**Vertical Movement =**

**Horizontal Movement =**

**Magnitude =**

3. (a) Find the values of  $x$  and  $y$  given the operation  $\begin{pmatrix} 2 & 3 \\ y & -2 \end{pmatrix} \begin{pmatrix} 1 \\ -4 \end{pmatrix} = \begin{pmatrix} x \\ 2 \end{pmatrix}$ . [4]

**Row 1 by Column 1 Equation**

**=**

**x =**

**Row 2 by Column 1 Equation**

**=**

**y =**

(b) If the matrix  $\begin{pmatrix} 4 & n \\ -1 & 1 \end{pmatrix}$  has a determinant of 10, find the value of  $n$ . [2]

**Determinant Formula**

**= 10**

**n =**