

- 1 Expand and simplify $(3x - y + 5)^2$.

$$9x^2 - 6xy + 30x - 10y + y^2 + 25$$

$$\frac{9x + 25}{2x^2 - 18} \quad [2]$$

- 2 (a) Express as a single fraction in its simplest form $\frac{x+1}{2x^2-18} - \frac{4}{3-x}$ [3]

- (b) Rearrange the formula $3x = \sqrt{\frac{y+3}{y-2}}$ to make y the subject. [3]

$$y = \frac{3 + 18x^2}{9x^2 - 1}$$

- 3 (a) Factorise completely $27x^3 - 125y^6$. $(3x - 5y^2)(9x^2 + 15xy^2 + 25y^4)$ [2]

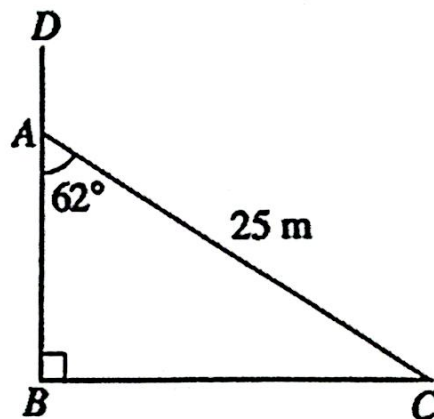
- (b) Hence, simplify $\frac{27x^3 - 125y^6}{9x^2 - 30xy^2 + 25y^4} \div \frac{(9x^2 + 15xy + 25y^2)}{9x^2 - 25y^4}$. [3]

$$\frac{(3x + 5y^2)(9x^2 + 15xy^2 + 25y^4)}{(9x^2 + 15xy + 25y^2)} \quad [2]$$

- 4 Solve $2x^2 - x = (2x-1)^2$.

$$x=1, 1/2$$

5

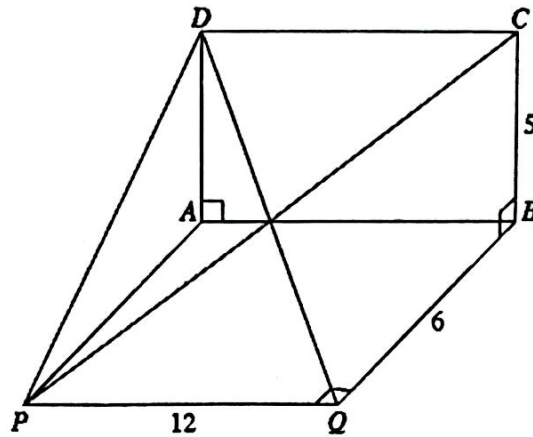


In the diagram, $\angle BAC = 62^\circ$ and $AC = 25$ m. Given that $\cos 62^\circ = 0.469$ when corrected to 3 significant figures, without using a calculator, find the value of $\cos \angle DAC$. -0.469 [1]

- 6 The area of triangle ABC is 67.8 cm^2 . $AB = 19.7 \text{ cm}$ and $BC = 13.6 \text{ cm}$.

Find the two possible sizes of the angle ABC . 30.4 and 149.6 deg [3]

7



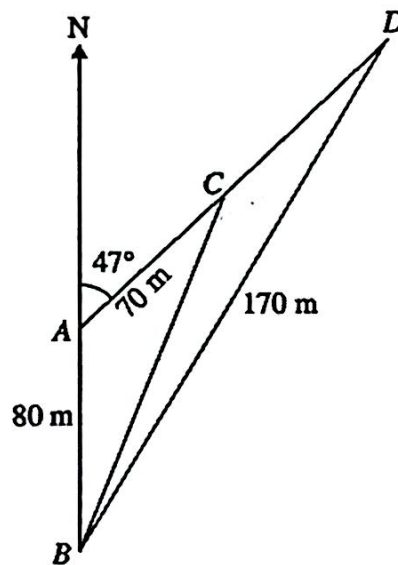
A rectangular billboard $ABCD$ is supported to stand vertically on a horizontal flat ground $ABQP$, by straight beams PQ , PD , AP , PC , QD and QB .

Given that PQ is perpendicular to QB , $BC = AD = 5$ m, $QB = PA = 6$ m and

$PQ = AB = 12$ m, find

- (a) the length of PC , 14.3m [2]
 (b) $\cos \angle AQD$. 0.937 [1]

8



The diagram shows a straight street ACD running from A in the direction 047° . B is 80m due south of A . It is given that $BD = 170$ m and $AC = 70$ m.

(a) Calculate

- (i) the bearing of D from B , 026.9 deg [2]
 (ii) the distance of BC . 138m [2]
 (iii) the shortest distance of A to the street BD . 36.2m [2]

(b) Given that there is a building at D and the angle of elevation of the top of the building from B is 33° , calculate the height of the building. 110m [2]

End of Paper