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

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

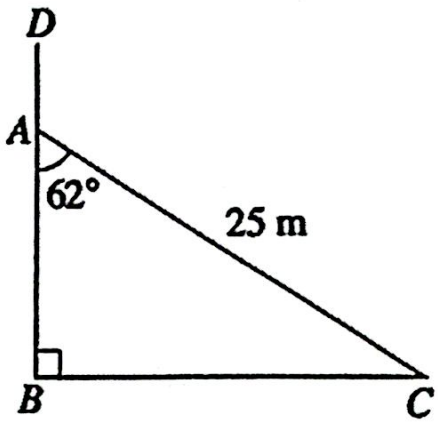
(b) Rearrange the formula $3x = \sqrt{\frac{y+3}{y-2}}$ to make y the subject. [3]

3 (a) Factorise completely $27x^3 - 125y^6$. [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]

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

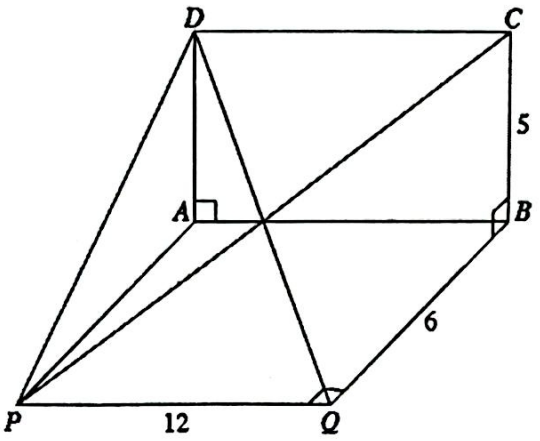
5



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

6 The area of triangle ABC is 67.8 cm^2. $AB = 19.7$ cm and $BC = 13.6$ cm.
Find the two possible sizes of the angle ABC. [3]

7



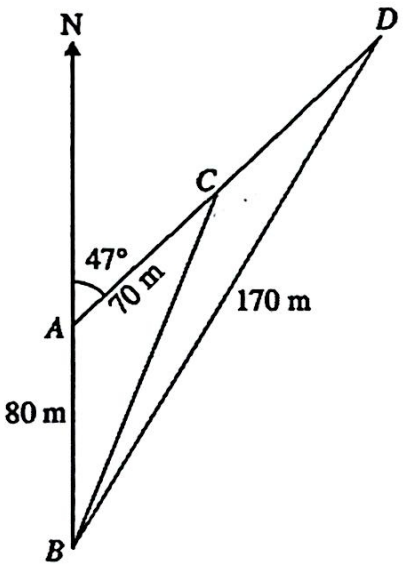
A rectangular billboard $ABCD$ is supported to stand vertically on a horizontal flat ground $ABQP$, by straight beams PQ, PD, AP, PC, QD and QB.

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, [2]

(b) $\cos\angle AQD$. [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, [2]

(ii) the distance of BC. [2]

(iii) the shortest distance of A to the street BD. [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. [2]

End of Paper