4a^2+b^2+c^2/64-4ab-ac/2-bc/4

1 **(a)** Expand and simplify $\left(2a-b+\frac{c}{8}\right)^2$. [2]

(b) Simplify $\frac{(p+2q)^2}{p^3+8q^3}\times\frac{(p^2-2pq)^2-16q^4}{p+2q}$. [3]

p^2-2pq-4q^2

2 Express $\frac{5}{12x+4y}+\frac{1}{2y-3x}+\frac{3}{9x^2-3xy-2y^2}$ as a single fraction, leaving your answer in its simplest form. [3]

(3x-14y+12)/(4(3x+y)(3x-2y))

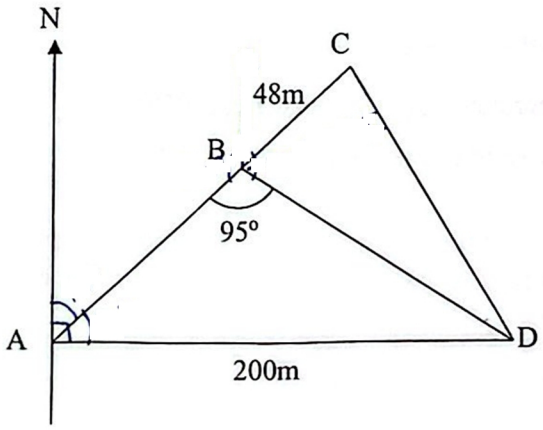
3 Make r the subject of the formula $3h=2p\sqrt{\frac{r+k}{r-k}}$. [3]

r=(9kh^2+4kp^2)/(9h^2-4q^2)

4 Solve $8(3p+2)^6=7(3p+2)^3+1$ by substituting $y=(3p+2)^3$. [4]

p=-5/6 or -1/3

5 A, B, C and D are four points on a horizontal field where D is due east of A. AD = 200m, BC = 48m and angle ABD = 95°. The bearing of B from A is 040°.



(a) Find the bearing of A from B. [1]

220 deg

(b) **Show** that the length of CD is 157.07 m, correct to 5 significant figures. [4]

(c) Find the shortest distance from B to CD. [2]

46.8

A pole of height 9.5 m is located at C.

(d) Calculate the angle of depression of D from the top of the pole at C. [2]

3.5 deg

6 Diagram I shows a figure formed using a **regular** hexagon *ABCDEF* and three identical sectors *OGH*, *OIJ* and *OKL*. The hexagon has sides 6 cm and the radius of the sectors is 9 cm. The centres of the hexagon and sectors coincide at *O* as shown in diagram II.

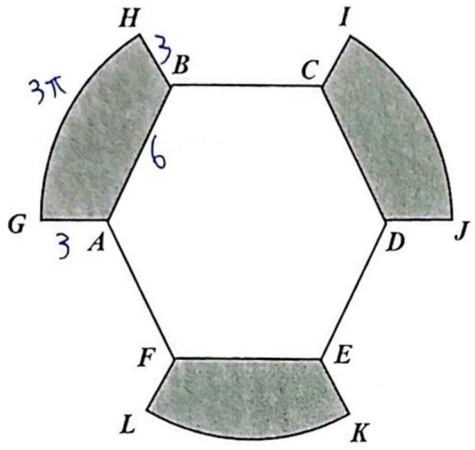


Diagram I

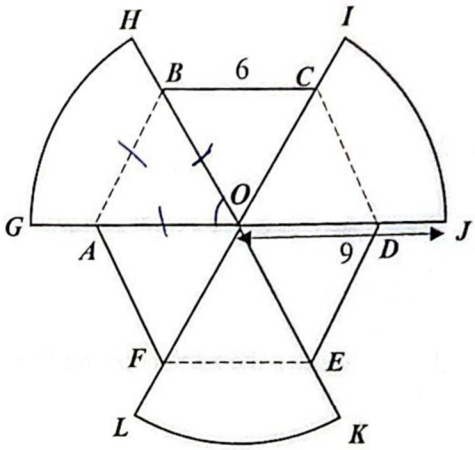


Diagram II

(a) Show that the angle *AOB* is $\frac{\pi}{3}$ rad. [1]

(b) Find

(i) the perimeter of the shaded area *ABHG*, 21.4 [2]

(ii) the area of whole figure in Diagram I. 174 [3]

End of Paper