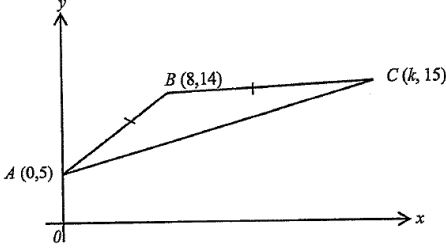
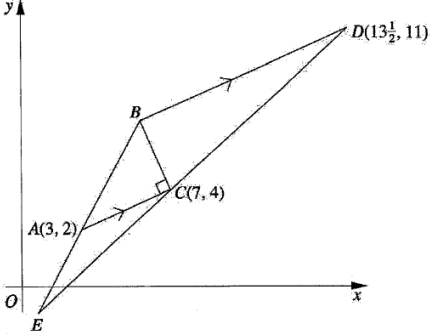
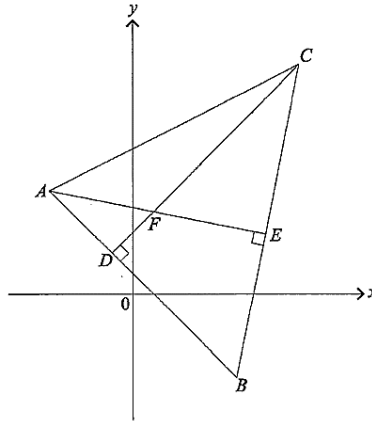


7 MUST KNOW QUESTIONS TO CONQUER COORDINATE GEOMETRY

| | |
|---|--|
| 1 |  <p>The diagram shows an isosceles triangle ABC with vertices $A(0,5)$, $B(8,14)$ and $C(k,15)$.</p> <p>(i) Find the value of k. D is a point on the x-axis such that $AD = CD$.</p> <p>(ii) Find the equation of BD. (iii) Find the coordinates of D. (iv) Find the areas of triangle ABC and of quadrilateral $ABCD$.</p> <p>Ans: (i) $k = -4$ (reject), $k = 20$, (ii) $y = -2x + 3$, (iii) $D(15,0)$ (iv) Area of $ABC = 50 \text{ units}^2$, Area of $ABCD = 175 \text{ units}^2$</p> |
| 2 |  <p>The diagram shows a triangle ABC in which the coordinates of the points A and C are $(3,2)$ and $(7,4)$ respectively. $\angle ACB = 90^\circ$. The line BD is parallel to AC and D is the point $(13\frac{1}{2}, 11)$. The lines BA and DC are extended to meet at E.</p> <p>Find</p> <p>(i) the equation of line BD, (ii) the coordinates of B, (iii) the ratio of the area of the quadrilateral $ABDC$ to the area of the triangle BCD.</p> <p>Ans: (i) $y = \frac{1}{2}x + \frac{17}{4}$ (ii) $B(5.5, 7)$ (iii) $3:2$</p> |

3



The vertices of the triangle ABC have coordinates $(-4, 5)$, $(5, -4)$ and $(8, 11)$ respectively. AE is perpendicular to BC , CD is perpendicular to AB , and AE and CD meet at F .

- (i) Find the coordinates of D and of F .
- (ii) Find the area of triangle ABC .

Ans: (i) $D = (-1, 2)$, $F (1, 4)$ (ii) $Area = 81 \text{ units}^2$

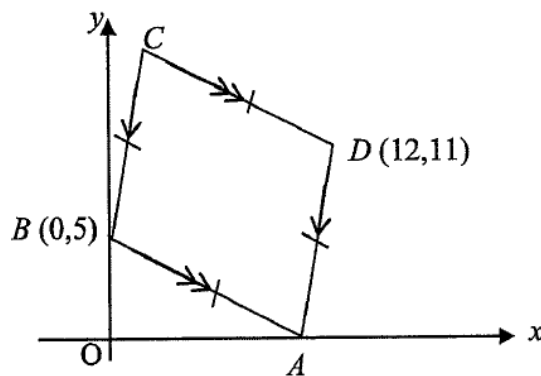
4

Given that the points $(d, 10d)$, $(0.75, 0)$ and $(1.5, 5 + 4d)$ are collinear, find the possible values of d .

Ans: $d = -0.5$ or $d = -1.875$

5

The diagram shows a rhombus $ABCD$. B and D are $(0, 5)$ and $(12, 11)$ respectively and A lies on the x -axis.



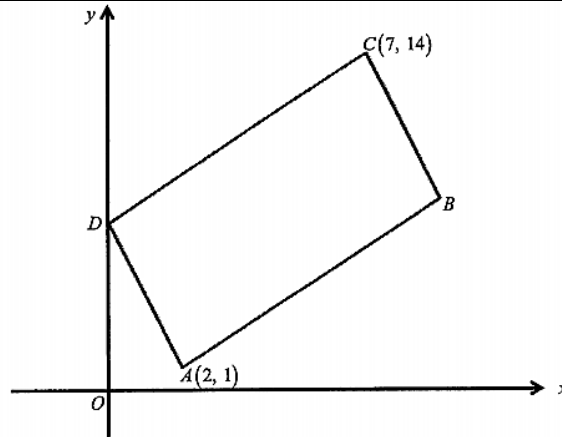
- (i) Show that the gradient of AC is -2 .

Find,

- (ii) the midpoint of BD ,
- (iii) the coordinates of A and C ,
- (iv) the area of $ABCD$.

Ans: (i) Shown, (ii) *Midpoint* $(6, 8)$ (iii) $A (10, 0)$ $C (2, 16)$ (iv) 120 units^2

6

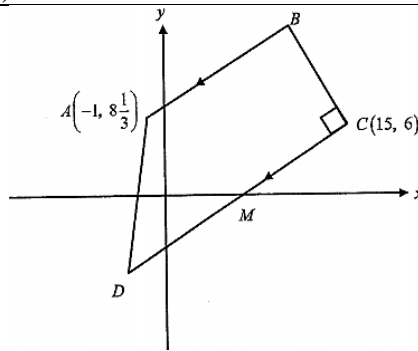


The diagram shows a parallelogram $ABCD$ in which the coordinates of the points A and C are $(2, 1)$ and $(7, 14)$ respectively. Given that the point D lies on the y -axis and that the gradient of AD is -3 , find

- (a) the coordinates of B and of D ,
- (b) the area of the parallelogram.

Ans: (a) $B(9, 8)$ $D(0, 7)$, (b) 56 units^2

7

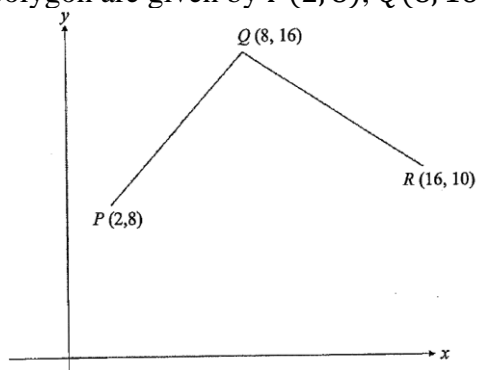


The diagram shows a trapezium $ABCD$ in which AB is parallel to DC and angle $BCD = 90^\circ$. The vertices of the trapezium are at the points $A(-1, 8\frac{1}{3})$, B , $C(15, 6)$ and D . DC cuts the x -axis at M , the midpoint of DC . Given that the equation of AB is $3y = 2x + 27$, find

- (i) the coordinates of B ,
- (ii) the coordinates of D ,
- (iii) the area of trapezium $ABCD$.

Ans: (i) $B = (9, 15)$, $D = (-3, -6)$, (iii) 182 units^2

- 8** The diagram below shows part of a polygon.
The three vertices of the polygon are given by $P(2, 8)$, $Q(8, 16)$ and $R(16, 10)$.



- (i) Show that $\angle PQR = 90^\circ$.
- (ii) Find the equation of the perpendicular bisector of PQ .
The perpendicular bisector of PQ intersects the line $3y = 4x - 9$ at point S .
- (iii) Show that the coordinate of S is $(9, 9)$.
- (iv) Determine if points P , R and S are collinear.
- (v) Find the area of PQS .

Ans: (i) Shown, (ii) $y = -\frac{3}{4}x + 15\frac{3}{4}$ (iii) Shown (iv) Yes. Since PR and RS have the same gradient and they share a common point R , they must be collinear. (v) 25 units^2