Straight Line Past Papers Unit 1 Outcome 1

Multiple Choice Questions

Each correct answer in this section is worth two marks.

1. The line with equation $y = ax + 4$ is perpendicular to the line with equation $3x + y + 1 = 0$.

   What is the value of a?

   A. -3

   B. $-\frac{1}{3}$

   C. $\frac{1}{3}$

   D. 3

[END OF MULTIPLE CHOICE QUESTIONS]

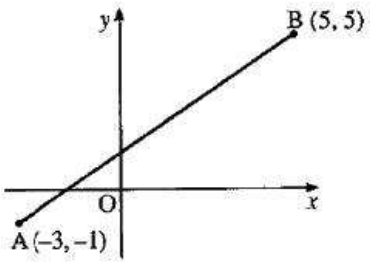
Written Questions

[SQA] 2. Find the equation of the perpendicular bisector of the line joining $A(2, -1)$ and $B(8, 3)$. **4**

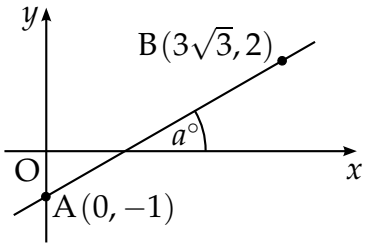
[SQA] 3. Find the equation of the straight line which is parallel to the line with equation $2x + 3y = 5$ and which passes through the point $(2, -1)$. **3**

[SQA] 4. Find the equation of the line through the point $(3, -5)$ which is parallel to the line with equation $3x + 2y - 5 = 0$. **2**

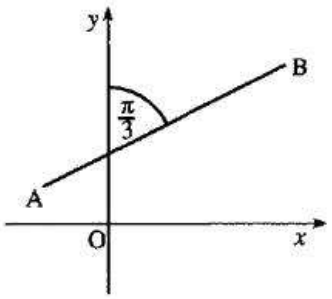
[SQA] 5. A and B are the points (–3, –1) and (5, 5).
Find the equation of
(*a*) the line AB **2**
(*b*) the perpendicular bisector of AB. **3**



[SQA] 6. Find the size of the angle $a°$ that the line joining the points $A(0,-1)$ and $B(3\sqrt{3},2)$ makes with the positive direction of the x-axis. **3**



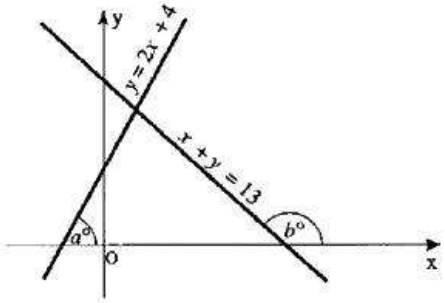
[SQA] 7. The line AB makes an angle of $\frac{\pi}{3}$ radians with the y-axis, as shown in the diagram. Find the exact value of the gradient of AB. **2**



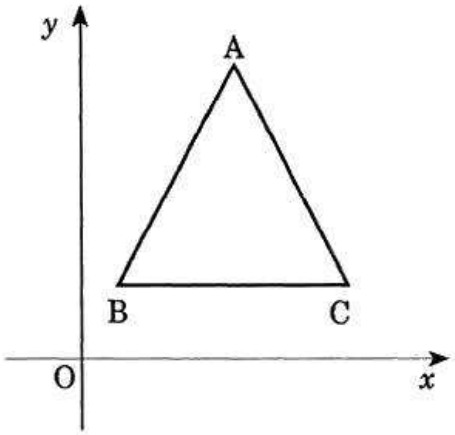
[SQA] 8. The lines $y = 2x + 4$ and $x + y = 13$ make angles of $a°$ and $b°$ with the positive direction of the x-axis, as shown in the diagram.

(*a*) Find the values of a and b. **4**

(*b*) **Hence** find the acute angle between the two given lines. **1**



[SQA] 9. A triangle ABC has vertices A(4, 8), B(1, 2) and C(7, 2).

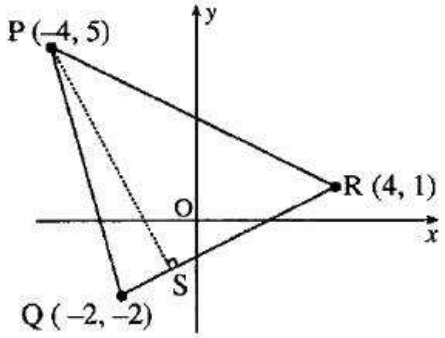


(*a*) Show that the triangle is isosceles. **(2)**

(*b*) (i) The altitudes AD and BE intersect at H, where D and E lie on BC and CA respectively. Find the coordinates of H. **(7)**

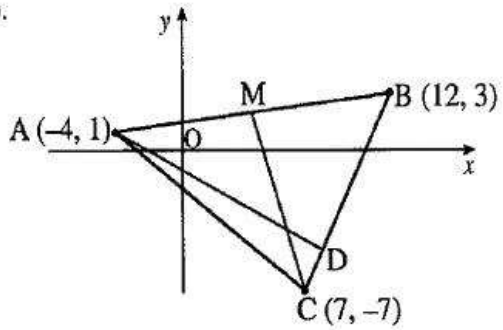
(ii) Hence show that H lies one quarter of the way up DA. **(1)**

[SQA] 10. P(–4,5), Q(–2,–2) and R(4, 1) are the vertices of triangle PQR as shown in the diagram. Find the equation of PS, the altitude from P. 3

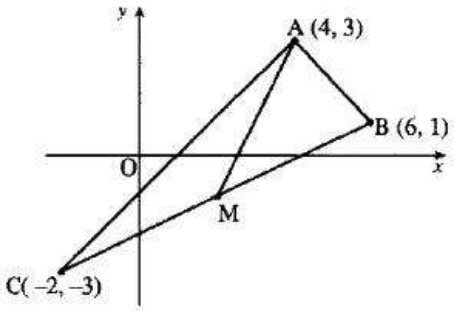


[SQA] 11. A triangle ABC has vertices A (–4, 1), B (12, 3) and C (7, –7).

(a) Find the equation of the median CM. 3
(b) Find the equation of the altitude AD. 3
(c) Find the coordinates of the point of intersection of CM and AD. 3

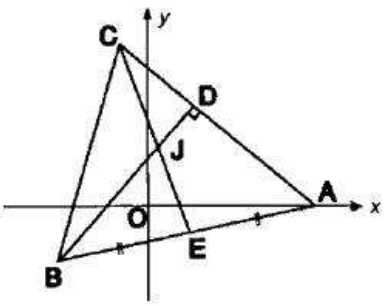


[SQA] 12. A triangle ABC has vertices A(4, 3), B(6, 1) and C(–2, –3) as shown in the diagram. Find the equation of AM, the median from A. 3

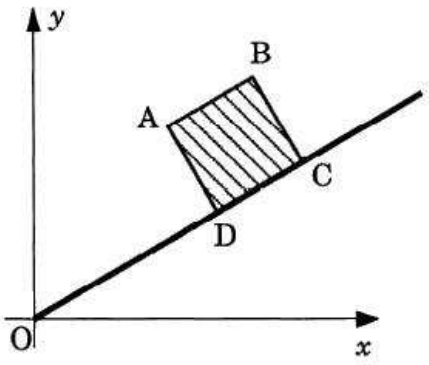


[SQA] 13. In the diagram A is the point (7,0), B is (–3,– 2) and C(–1,8). The median CE and the altitude BD intersect at J.

(a) Find the equations of CE and BD. 6
(b) Find the co-ordinates of J. 2



[SQA] 14. ABCD is a square. A is the point with coordinates (3,4) and ODC has equation $y = \frac{1}{2}x$.



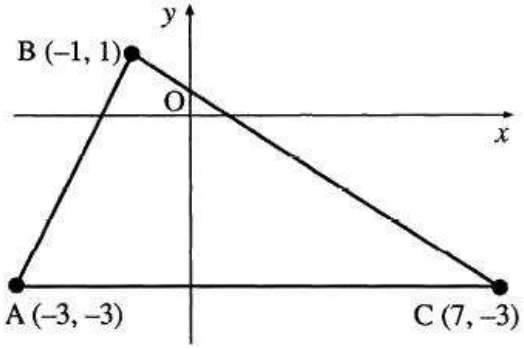
(*a*) Find the equation of the line AD. **(3)**

(*b*) Find the coordinates of D. **(3)**

(*c*) Find the area of the square ABCD. **(2)**

[SQA] 15. A triangle ABC has vertices A(–3, –3), B(–1, 1) and C(7, –3).

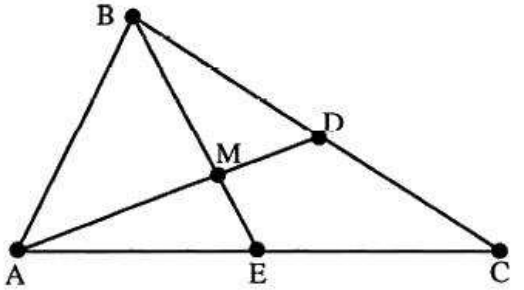
(*a*) Show that thc triangle ABC is right-angled at B. **(3)**



(*b*) The medians AD and BE intersect at M.

(i) Find the equations of AD and BE. **(5)**

(ii) Hence find the coordinates of M. **(3)**



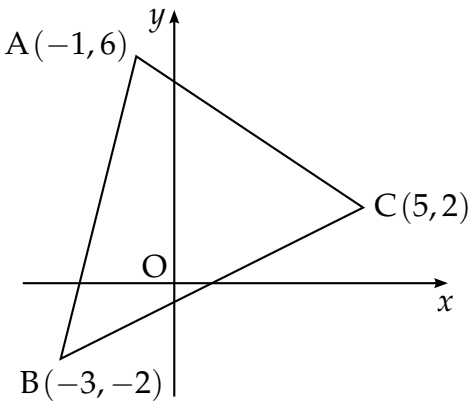
[SQA] 16. Triangle ABC has vertices $A(-1,6)$, $B(-3,-2)$ and $C(5,2)$.

Find

(*a*) the equation of the line p, the median from C of triangle ABC. **3**

(*b*) the equation of the line q, the perpendicular bisector of BC. **4**

(*c*) the coordinates of the point of intersection of the lines p and q. **1**



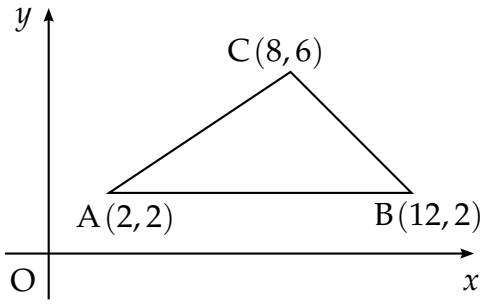
[SQA] 17. Triangle ABC has vertices $A(2,2)$, $B(12,2)$ and $C(8,6)$.

(*a*) Write down the equation of l_1, the perpendicular bisector of AB. **1**

(*b*) Find the equation of l_2, the perpendicular bisector of AC. **4**

(*c*) Find the point of intersection of lines l_1 and l_2. **1**

(*d*) Hence find the equation of the circle passing through A, B and C. **2**



[SQA] 18. The vertices of a triangle are $P(-1,1)$, $Q(2,1)$ and $R(-6,2)$. Find the equation of the altitude of triangle PQR, drawn from P. **3**

[SQA] 19. Find the equation of the median AD of triangle ABC where the coordinates of A, B and C are $(-2,3)$, $(-3,-4)$ and $(5,2)$ respectively. **3**

[END OF WRITTEN QUESTIONS]