HIGHER MATHEMATICS

**Answers to Exam Questions on The Straight Line**

**1.** B  **2.** A **3.** B **4.** D

**5.** D **6.** B **7.** A **8.** D

**9.** C **10.** B **11.** A

**12.**  **13.**  **14.** 

**15.**  **16.**  **17.** 

**18.** 

**19.**(a)  (b) D(4, 2) (c) 5 units2

**20.**(a)(i)  (ii) T(2, 2) (iii) P(−1, −4)

**21.**(b) Q(22, 0); R(24, 6)

**22.**(a) Equation of PR:  Equation of QS: 

 Point of intersection of diagonals = (4, 4)

 (b) S(2, 5)

**23.** 

**24.**(a)  (b) 

**25.**(a)  and ;

, so  and  are not parallel and hence the points ,  and *S* are not collinear since  is a common point. This means that the frigate will not pass directly over the submarine.

 (b)  and ;

, so  and  are parallel and hence the points ,  and *S* are collinear since  is a common point. This means that the frigate will pass directly over the submarine.

**26.**  **27.** 

**28.**(a) ;  (b) 

**29.**(a)  (b)  (1 dp)

**30.**(a) 

 (b) Line 1 with equation  has gradient ;

 , hence AB is perpendicuar to Line 1.

 Line 2 with equation  has gradient ;

 , hence  and AB is not perpendicuar to

Line 2.

**31.**  **32.**  **33.** 

**34.**   **35.** 

**36.**(a)  (b) 

**37.**(a)  (b)  (c) (2, 3)

**38.**(a)  (b)  (c)  (d)  units

**39.**(a)  (b)  (c) (0, 2)

**40.**(b)  (b) (1, −1)

**41.**(a) Equation of CE:  Equation of BD: 

 (b) J(1, 2)

**42.**(a) ,  and , hence triangle ABC is isosceles with AB = AC.

 (b) 

**43.**(a)  (b)  (c) (6, −4)

**44.**(b)  (c) (3, 1)

**45.**(a)(i) M(2, 4) (ii)  (b) 

 (c) The midpoint of PR is (5, 1) and the coordinates satisfy the equation of line *L*

 (), hence line *L* passes through the midpoint of PR.

**46.**(a) P(−3, 0) (b)  (c) T(5, 4)

**47.**(a)  (b) E(5, 6)

 (c)(i) 

 (ii) The coordinates of E(5, 6) satisfy the equation of the perpendicular bisector of AB

 (), hence this line passes through E.

**48.**(a)  (b)  (c) P(5, 4)

 (d)  and , hence  and PQ is parallel to BC.

**49.**(a)  (b) T(1, 4) (c) R(−3, 2); S(−1, −2)

**50.**  and ;

, so AB and BC are not parallel and hence the points A, B and C are not collinear since B is a common point.

**51.** The lines are not concurrent since Lines 1 and 2 intersect at the point (5, −2) and this point does not lie on Line 3.

**52.**(a)  (b) T(1, 4) (c) 

**53.**(a) 

 (b) The coordinates of T(6, 12) satisfy the equation of BQ (), hence T lies on BQ.

 (c) 2 : 1

**54.**(a)  and ;

 , hence AB is perpendicular toBC and triangle ABC is

 right-angled atB

 (b)(i) Equation of AD:  Equation ofBE: 

 (ii) 