High School
Mathematics Test 2014

Year 9

Coordinate Geometry

Non Calculator

Skills and Knowledge Assessed:

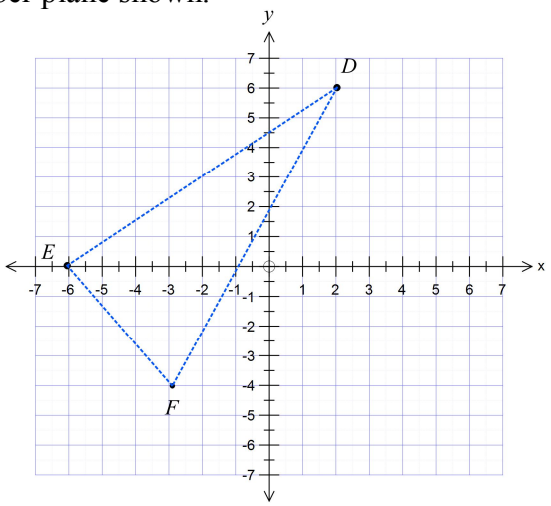
- Find the distance between two points located on a Cartesian plane using a range of strategies, including graphing software (ACMNA214)
- Find the midpoint and gradient of a line segment (interval) on the Cartesian plane using a range of strategies, including graphing software (ACMNA294)

Name_____

Section 1 Short Answer Section

Write all working and answers in the spaces provided on this test paper.

Question 1 – 5 refer to the number plane shown.



1. Plot and label the points $G(6, 4)$, $H(-5, 6)$ and $I(6, -1)$ on the number plane above.

2. What are the coordinates of the points *D* and *E*?

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3. The point *C* is the fourth vertex of a parallelogram *CDEF*. Draw the parallelogram and write down the coordinates of *C*.

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4. What is the midpoint of the interval DE ?

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5. What is the gradient of the interval DF ?

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6. What is the length of the interval DE ?

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7. ABCD is a kite.

The coordinates of A and B are given.

What are the coordinates of the points C and D ?

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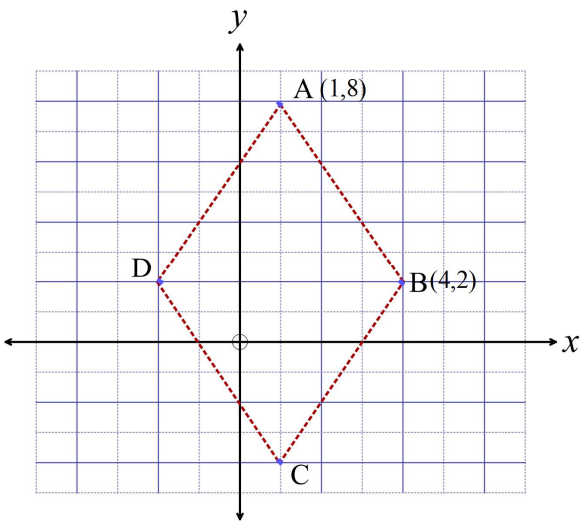

8. What is the gradient of the line joining $S(-2, -6)$ and $T(3,4)$.

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9. What is the length of the interval joining $P(4, -6)$ and $Q(5, 3)$.

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10. What is the midpoint of the interval joining $E(-5, -10)$ and $F(-7, 4)$.

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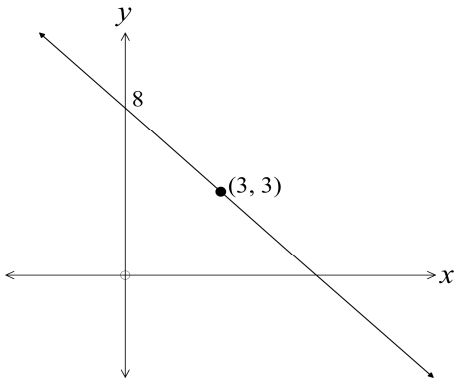
11. What is the gradient of the line shown?



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12. The interval joining $P\ (a, 15)$ and $Q\ (-2, 3)$ has a gradient of $\frac{1}{2}$.
What is the value of a?

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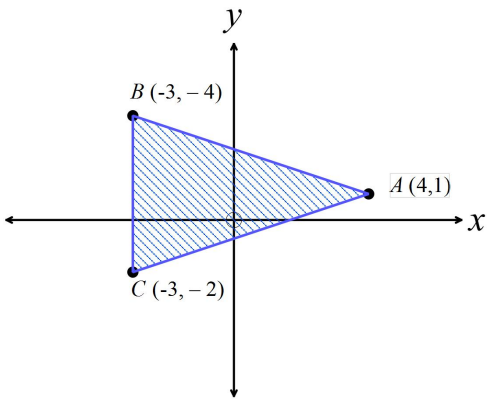
13. Find the area of the triangle ABC.



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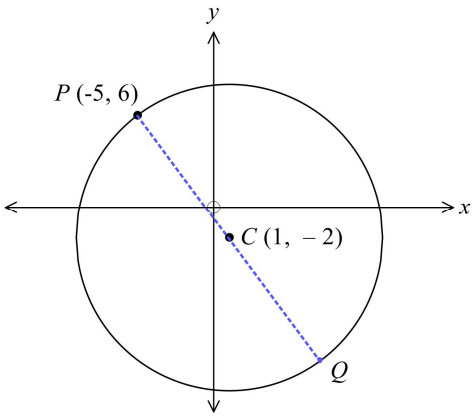
Questions 14 and 15 refer to the diagram below.

A circle is drawn on the number plane with its centre at the point C (1, -2). The point P (-5, 6) lies on the circle.



14. What is the length of the diameter PQ of the circle?

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15. What are the coordinates of the point Q?

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High School
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Year 9 **Coordinate Geometry**

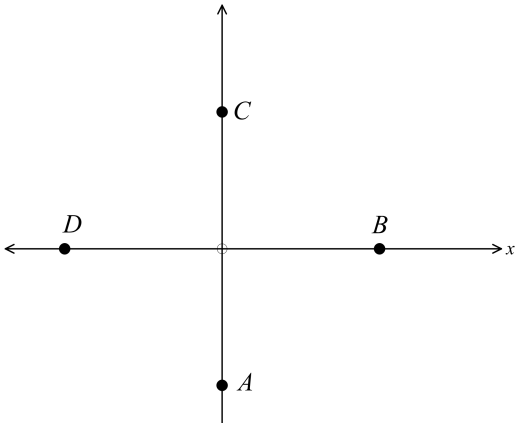
Calculator Allowed

Name_____

Section 2 Multiple Choice Section

Mark all your answers on the accompanying multiple choice answer sheet, not on this test paper. You may do any working out on this test paper. Calculators are allowed for this section.

1. Which of the points, A, B, C or D could have coordinates (0, -5)?



2. The point (-5, 6) lies in the:

A. first quadrant. B. second quadrant.

C. third quadrant D. fourth quadrant.

3. What is the midpoint of the interval joining (2, 3) and (4, 9)?

A. (3, 6) B. (6, 6) C. (3, 12) D. (6, 12)

4. E is the point $(-2, -2)$ and F is the point $(1, 4)$.

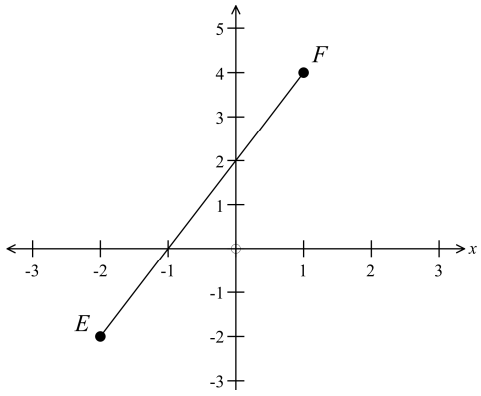
What is the gradient of the line EF?

A. -2

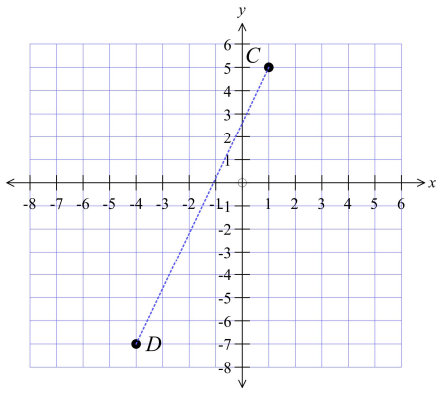
B. $-\frac{1}{2}$

C. $\frac{1}{2}$

D. 2



5. What is the distance between the points $C(1, 5)$ and $D(-4, -7)$.



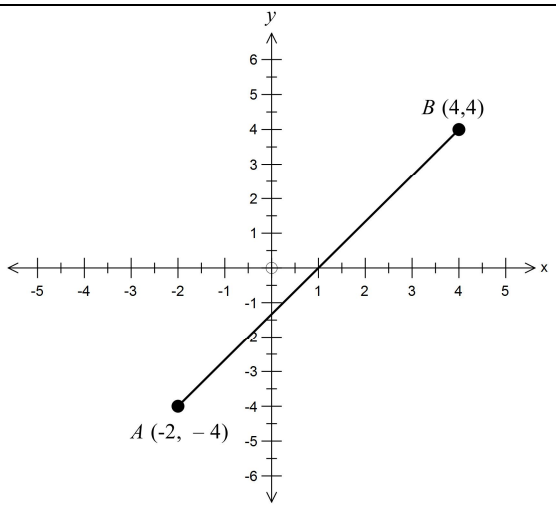
A. 5 cm

B. 12 cm

C. 13 cm

D. 17 cm

Questions 6 – 8 refer to the number plane shown.



6. Find the midpoint of the interval AB.

A. (-1, -1) B. (1, 0) C. (1, 1) D. (2, 0)

7. What is the gradient of the interval AB?

A. $-\frac{4}{3}$ B. $-\frac{3}{4}$ C. $\frac{3}{4}$ D. $\frac{4}{3}$

8. What is the length of the interval AB?

A. $\sqrt{10}$ units B. $\sqrt{14}$ units C. 10 units D. 14 units

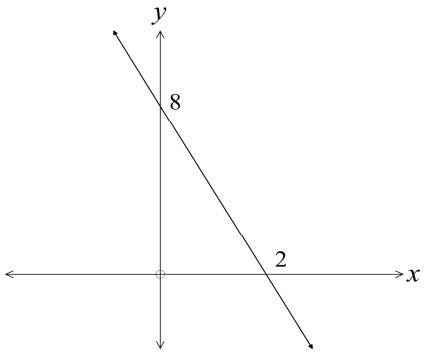
9. Find the gradient of the interval joining $E(6, -7)$ and $F(-3, 2)$.

A. -1 B. $-\frac{1}{2}$ C. $\frac{1}{2}$ D. 1

10. Find the length of the interval joining $G(-2, 4)$ and $H(-5, -2)$.

A. 3 units B. $\sqrt{18}$ units C. $\sqrt{45}$ units D. 9 units

11. The gradient of the line shown is :



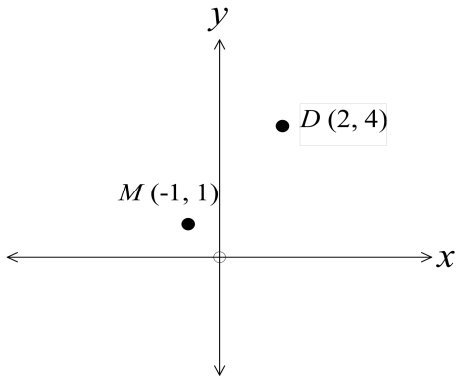
A. -4

B. -2

C. $\frac{1}{2}$

D. 2

12. M (-1, 1) is the midpoint of the interval DE.
D has coordinates (2, 4).
What are the coordinates of E?



A. $(-4, -4)$

B. $(-4, -2)$

C. $\left(\frac{1}{2}, 2\frac{1}{2}\right)$

D. $(2, 7)$

13. The distance ST is 15 units, and the point S has coordinates (12, -5).

Which of the following could be the coordinates of T?

A. $(-2, -1)$ B. $(-2, 3)$ C. $(3, 7)$ D. $(-3, 7)$

14. The interval EF has a gradient of $-\frac{2}{3}$.

If E is the point $(3, -5)$, which of the following could be the coordinates of F?

A. $(1, -1)$ B. $(1, 1)$ C. $(5, -2)$ D. $(0, -3)$

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Coordinate Geometry

Multiple Choice Answer Sheet

Name _____

Completely fill the response oval representing the most correct answer.

1.	A ⬭	B ⬭	C ⬭	D ⬭
2.	A ⬭	B ⬭	C ⬭	D ⬭
3.	A ⬭	B ⬭	C ⬭	D ⬭
4.	A ⬭	B ⬭	C ⬭	D ⬭
5.	A ⬭	B ⬭	C ⬭	D ⬭
6.	A ⬭	B ⬭	C ⬭	D ⬭
7.	A ⬭	B ⬭	C ⬭	D ⬭
8.	A ⬭	B ⬭	C ⬭	D ⬭
9.	A ⬭	B ⬭	C ⬭	D ⬭
10.	A ⬭	B ⬭	C ⬭	D ⬭
11.	A ⬭	B ⬭	C ⬭	D ⬭
12.	A ⬭	B ⬭	C ⬭	D ⬭
13.	A ⬭	B ⬭	C ⬭	D ⬭
14.	A ⬭	B ⬭	C ⬭	D ⬭

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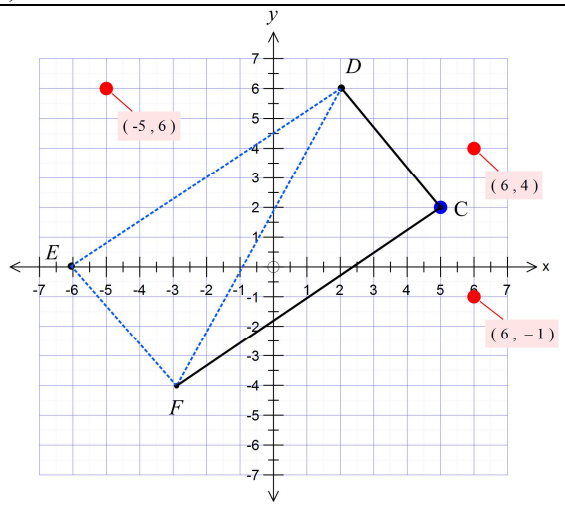
Coordinate Geometry

ANSWERS

Section 1 (1 mark each)	
	Working and Answers
1.	See graph in Q 3.
2.	D is (2,6) and E is (-6, 0).
3.	 C is (5, 2).
4.	$MP = \left(\frac{-6+2}{2}, \frac{0+6}{2}\right) = (-2,3)$
5.	$m = \frac{6+4}{2+3}$ $= \frac{10}{5}$ $= 2$
6.	$DE = \sqrt{(2+6)^2 + (6-0)^2}$ $= \sqrt{64+36}$ $= \sqrt{100}$ $= 10$
7.	Diagonals intersect at right angles, so C has same x value as A and is 6 units below B so is **C(1, -4)** and D has same y value as B and is 3 units left of A so is **D is (-2, 2)**
8.	$m = \frac{4+6}{3+2}$ $= \frac{10}{5}$ $= 2$
9.	$d = \sqrt{(5-4)^2 + (3+6)^2}$ $= \sqrt{1+81}$ $= \sqrt{82}$
10.	$MP = \left(\frac{-5-7}{2}, \frac{-10+4}{2}\right) = \left(-\frac{12}{2}, -\frac{6}{2}\right) = (-6, -3)$

11.	$m = \dfrac{8-3}{0-3}$ $= \dfrac{5}{-3}$
12.	$\dfrac{1}{2} = \dfrac{15-3}{a+2}$ $a + 2 = 2(12)$ $a + 2 = 24$ $a = 22$
13.	Base runs vertically from (-3, 4) and (-3, -2) which is 6 units. Perp height runs horizontally from x = -3 to x = 4 which is 7 units. Area = $\dfrac{1}{2} \times 6 \times 7$ = 21 cm^2
14.	Radius = $\sqrt{(1+5)^2 + (-2-6)^2}$ $= \sqrt{36 + 64}$ $= \sqrt{100}$ = 10 units Diameter = 20 units
15.	The centre is the midpoint of the diameter. $(1, -2) = \left(\dfrac{x-5}{2}, \dfrac{y+6}{2}\right)$ $x - 5 = 2$ $x = 7$ $y + 6 = -4$ $y = -10$ Endpoint Q is (7, – 10)

Section 2 (1 mark each)		
	Working	Answers
1.	A is (0,-5)	A
2.	2^{nd} quadrant	B
3.	$MP = \left(\frac{2+4}{2}, \frac{3+9}{2}\right) = (3,6)$	A
4.	$m = \frac{4+2}{1+2}$ $= \frac{6}{3}$ $= 2$	D
5.	$d = \sqrt{(1+4)^2 + (5+7)^2}$ $= \sqrt{25+144}$ $= \sqrt{169}$ $= 13$	C
6.	$MP = \left(\frac{4-2}{2}, \frac{4-4}{2}\right) = (1,0)$	B
7.	$m = \frac{4+4}{4+2}$ $= \frac{8}{6}$ $= \frac{4}{3}$	D
8.	$d = \sqrt{(4+2)^2 + (4+4)^2}$ $= \sqrt{36+64}$ $= \sqrt{100}$ $= 10$	C
9.	$m = \frac{-7-2}{6+3}$ $= -\frac{9}{9}$ $= -1$	A
10.	$d = \sqrt{(-2+5)^2 + (4+2)^2}$ $= \sqrt{9+36}$ $= \sqrt{45}$	C
11.	$m = \frac{rise}{run} = -\frac{8}{2} = -4$	A
12.	$\frac{2+x}{2} = -1$ $\quad \frac{4+y}{2} = 1$ $2+x = -2$ $\quad 4+y = 2$ $x = -4$ $\quad y = -2$	B
13.	$(-2-12)^2 + (-1+5)^2 = 212 \neq 15^2$ $(-2-12)^2 + (3+5)^2 = 260 \neq 15^2$ $(3-12)^2 + (7+5)^2 = 225 = 15^2$ $(-3-12)^2 + (7+5)^2 = 369 \neq 15^2$	C

14.	Let F be (x, y) *By* testing $\frac{-1+5}{1-3} = \frac{4}{-2} = -2$ $\frac{1+5}{1-3} = \frac{6}{2} = 3$ $\frac{-2+5}{5-3} = \frac{3}{2}$ $\frac{-3+5}{0-3} = -\frac{2}{3}$	D

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Coordinate Geometry

Multiple Choice Answer Sheet

Name ___Marking Sheet

Completely fill the response oval representing the most correct answer.

1.	A ●	B ○	C ○	D ○
2.	A ○	B ●	C ○	D ○
3.	A ●	B ○	C ○	D ○
4.	A ○	B ○	C ○	D ●
5.	A ○	B ○	C ●	D ○
6.	A ○	B ●	C ○	D ○
7.	A ○	B ○	C ○	D ●
8.	A ○	B ○	C ●	D ○
9.	A ●	B ○	C ○	D ○
10.	A ○	B ○	C ●	D ○
11.	A ●	B ○	C ○	D ○
12.	A ○	B ●	C ○	D ○
13.	A ○	B ○	C ●	D ○
14.	A ○	B ○	C ○	D ●