ANSWERS

Please return to: PJR

Name: .....

Form: .....

Teacher's Initials: .....

ALLEYN'S SCHOOL

MATHEMATICS EXAM

YEAR 8

Non-Calculator

SUMMER 2012

Time allowed 75 minutes

Calculators **MAY NOT** be used.

Show your working as there may be marks given for working out.

There are **17 questions** on the paper. If you cannot answer a question, leave it and go on to the next question.

1. Expand and simplify where possible.

a. 5 (x + 4)

5x + 20 (1)

b. 10a + 3 (a – 4)

10a + 3a – 12

13a – 12 (2)

c. 7 (2t + 1) – 8t

14t + 7 – 8t

6t + 7 (2)

d. 5 (f + 3) – 2 (3f – 8)

5f + 15 – 6f + 16

31 – f (3)

2.

a. Write down the first 4 multiples of 14

14, 28, 42, 56 (2)

b. Find the Lowest common multiple of 6 and 14

6 12 18 24 30 36 42

42 (2)

3. Simplify the following

a. $x^4 \times x^7 =$ x^{11} 4+7

b. $m^8 \div m =$ m^7 8-1 (1)

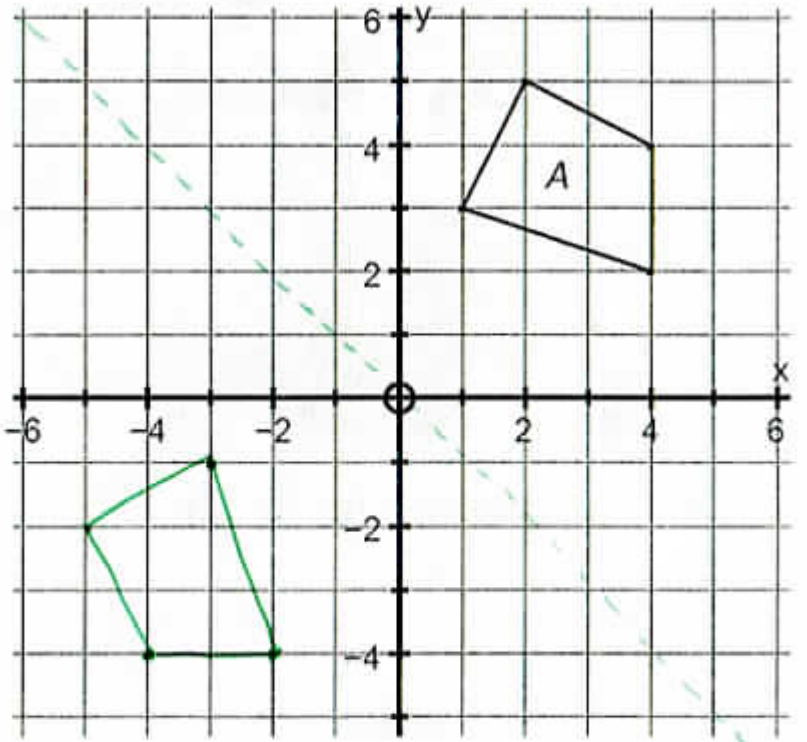
c. $f^2 \times f^6 =$ f^8 2--6 (1)

d. $(g^3)^7 =$ g^{21} (1)

e. $\frac{a^5 \times a^3}{a^5} =$ $\frac{a^9}{a^5}$ $= a^4$. (1)

= _____ (2)

4. Reflect shape *A* in the line y = -x

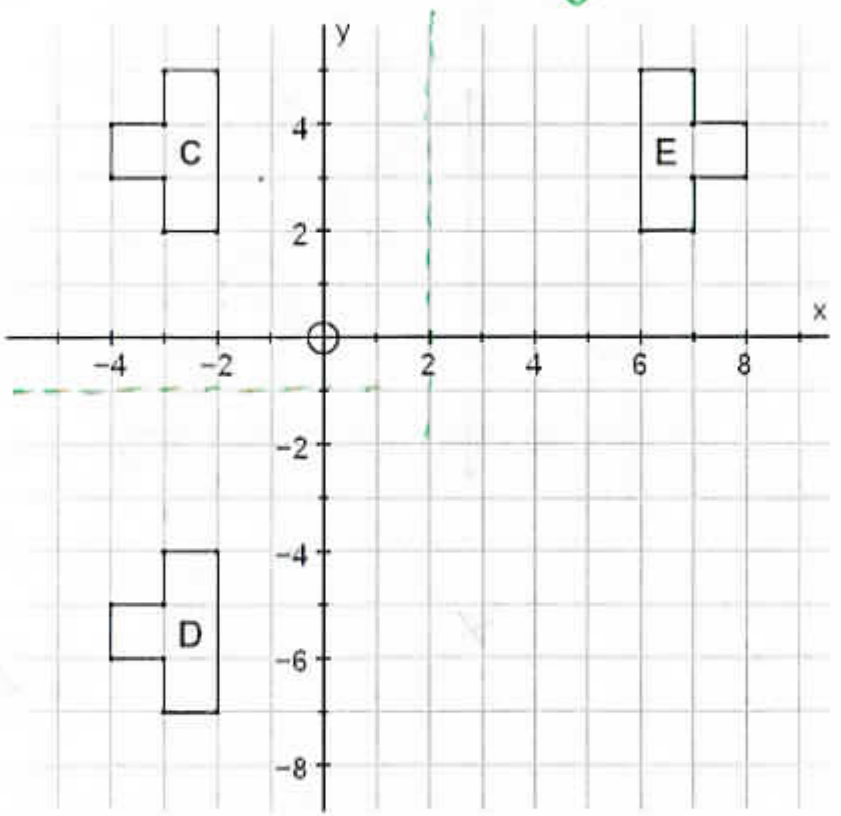


(3)

5.

a. In the diagram below, write down the equation of the line that reflects shape *C* onto shape *D*

$y = -1$ (1)



b. Write down the equation of the line that reflects shape *C* onto shape *E*

$x = 2$ (1)

6. Calculate the value of the following expressions when

$a = 4$ $b = -3$ $c = 0.5$

a. $a^2 - b^2$ $4^2 - (-3)^2 = 16 - 9 = 7$

$= 7$ (2)

b. $ac - b$

$4 \times 0.5 - (-3) = 2 + 3$

$= 5$ (2)

c. $\frac{a+c}{b}$ $\frac{4+0.5}{-3} = \frac{4.5}{3}$

$= -1.5$ (2)

7.

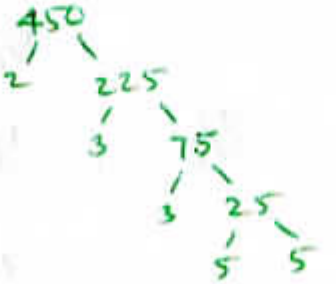
a. Write 84 as a product of its prime factors

$2 \times 2 \times 3 \times 7$

$2^2 \times 3 \times 7$

(2)

b. Write 450 as a product of its prime factors

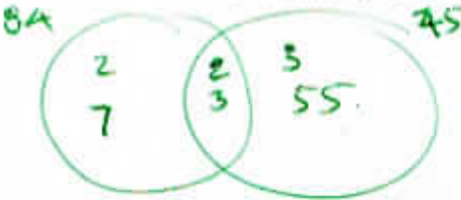


$2 \times 3 \times 3 \times 5 \times 5$

$2 \times 3^2 \times 5^2$

(2)

c. Find the highest common factor of 84 and 450



6 (2)

8. $D = \frac{4+p}{e} - r$

Calculate the value of D when $p = -2$, $e = \frac{1}{3}$, $r = 5$

$$\frac{4+(-2)}{1/3} - 5$$

$$= 2 \div 1/3 - 5$$

$$= 2 \times \frac{3}{1} - 5 = 1$$

= _____ (3)

9. 6 scrabble letters A, B, C, D, E and F are placed in a bag and one tile is picked at random.
Find the probability of:

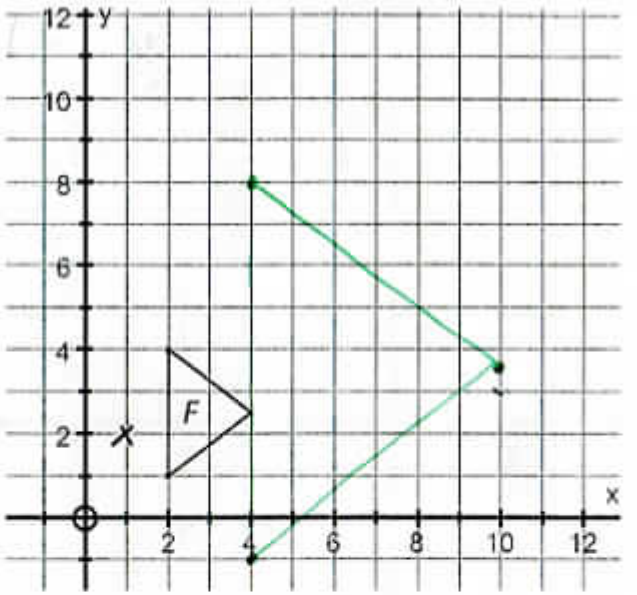
a. picking a D 1/6 _____ (1)

b. not picking a D 5/6 _____ (1)

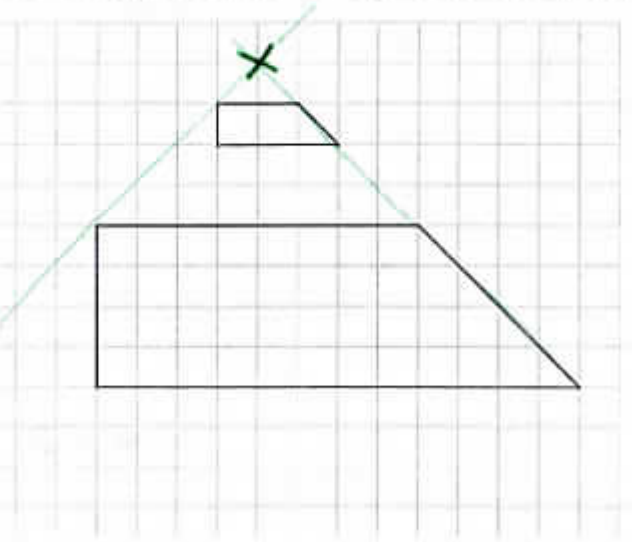
c. picking a vowel 2/6 1/3 _____ (1)

d. not picking a vowel 2/3 _____ (1)

10. Enlarge shape F by scale factor 3 centre (1,2) (3)



11. Find the scale factor and mark on the diagram the centre of enlargement.



× 4.

Scale factor = _____ (2)

12.

a. List the factors of 36.

1, 2, 3, 4, 6, 9, 12, 18, 36 (3)

b. Write down all the prime numbers between 20 and 30.

23, 29

(2)

13. Calculate. Show all steps in your working

a. $\frac{3}{4} \times \frac{1}{5}$

= 3/20 (1)

b. $\frac{4}{7} \times \frac{5}{12}$ 3

= 5/21 (2)

c. $2\frac{2}{5} \times 2\frac{2}{9}$ $\frac{4}{1}\frac{12}{5} \times \frac{20}{9}\frac{4}{3} = \frac{16}{3}$

= 5 1/3 (3)

d. $\frac{4}{7} \div \frac{3}{5}$ $\frac{4}{7} \times \frac{5}{3}$

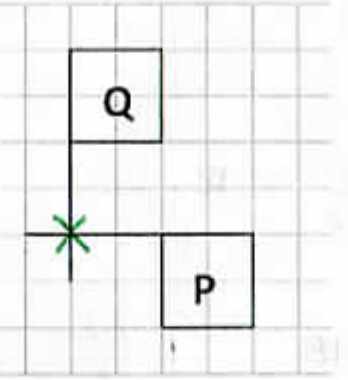
= 20/21 (2)

e. $2\frac{2}{3} \div 1\frac{1}{9}$ $\frac{8}{3} \div \frac{10}{9}$

$\frac{4}{1}\frac{8}{3} \times \frac{9}{10}\frac{3}{5} = \frac{12}{5}$

= 2 2/5 (2)

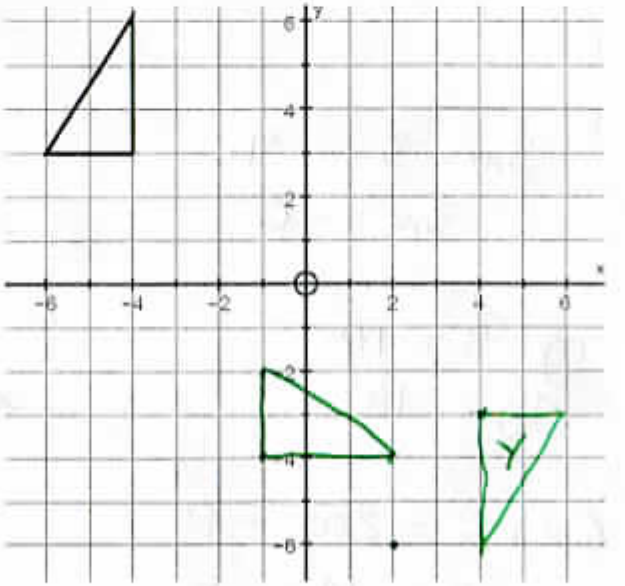
14. Describe the Rotation from shape P to shape Q and mark on the diagram the centre of rotation with a cross.



90° anticlockwise

(3)

15.



a. Rotate Shape X 180° about the origin. Label your new shape Y.

(2)

b. Rotate shape Y 90° Anti-clockwise about the point (2, -6)

(2)

16. Solve the following equations

a. $5x = 10$

$x =$ 2 (1)

b. $\frac{a}{2} - 7 = 11$ $\frac{9}{2} = 18$

$a =$ 36 (1)

c. $3t + 5 = 23$

$3t = 18$

$t =$ 6 (2)

d. $7 - 2y = 6$

$1 = 2y$

$y =$ 1/2 (2)

e. $5m - 3 = 2m - 9$

$3m - 3 = -9$

$3m = -6$

$m =$ −2 (3)

f. $4(g - 2) = 10$

$4g - 8 = 10$

$4g = 18$

$g =$ 4.5 (3)

g. $3(2x + 1) = 4(5x - 2)$

$6x + 3 = 20x - 8$

$3 = 14x - 8$

$11 = 14x$

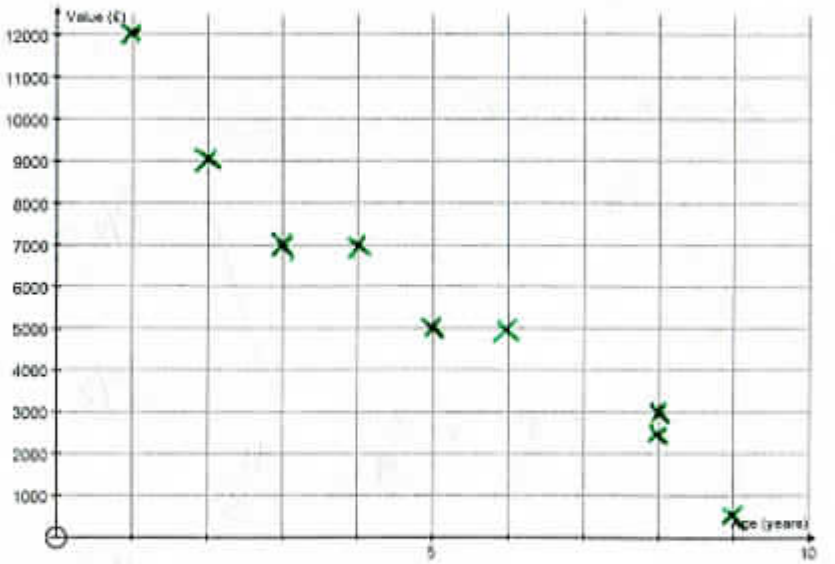
$x =$ 11/14 (4)

54/7

17. The table below shows the value of saloon cars compared to their ages.

Age (years)	5	2	8	1	4	6	3	8	9
Value £	5,000	9,000	3,000	12,000	7,000	5,000	7,000	2,500	500

a. On the axes below plot the scattergraph of the data



(3)

b. Comment upon the correlation of the data

Strong negative (1)

c. Draw a line of best fit (1)