

Name: \_\_\_\_\_

GCSE 9-1 Higher  
Practice Paper  
Set B  
Paper 3 - Calculator



**Equipment**

1. A black ink ball-point pen.
2. A pencil.
3. An eraser.
4. A ruler.
5. A pair of compasses.
6. A protractor.
7. A calculator

**Guidance**

1. Read each question carefully.
2. Don't spend too long on one question.
3. Attempt every question.
4. Check your answers seem right.
5. Always show your workings

**Information**

1. Time: 1 hour 30 minutes
2. The maximum mark for this paper is 80.
3. You may use tracing paper.

Question	Mark	Available
1		4
2		4
3		3
4		2
5		3
6		2
7		2
8		4
9		2
10		3
11		3
12		5
13		3
14		5
15		5
16		7
17		6
18		5
19		2
20		5
21		5
<b>Total</b>		<b>80</b>

1. Sally is raising money for charity.  
The table below has been given to her from the website.  
The donation amounts are in pounds.

Donation	Frequency
$0 < d \leq 5$	44
$5 < d \leq 10$	35
$10 < d \leq 20$	16
$20 < d \leq 50$	3
$50 < d \leq 100$	2

- (a) Calculate an estimate for the mean donation.

£.....  
**(3)**

- (b) What percentage of the donations are greater than £20?

.....%  
**(1)**

2. Nancy goes to the Post Office to exchange money.



Exchange Rates

£1 : \$1.31

£1 : €1.14

\*Commission Charged

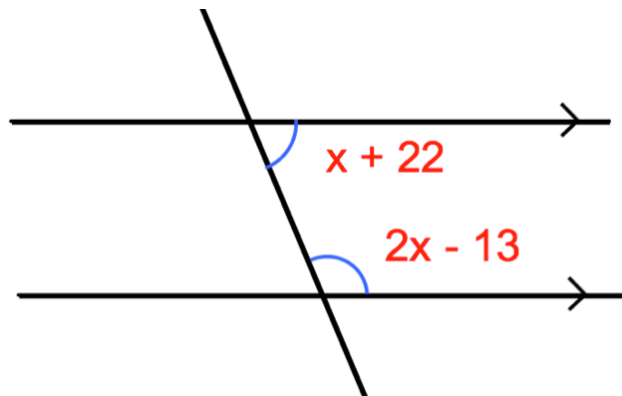
Nancy changes \$759.80 and €342 into pounds sterling.

The Post Office deducts their commission and gives Nancy £827.20

What is the percentage commission?

.....%  
**(4)**

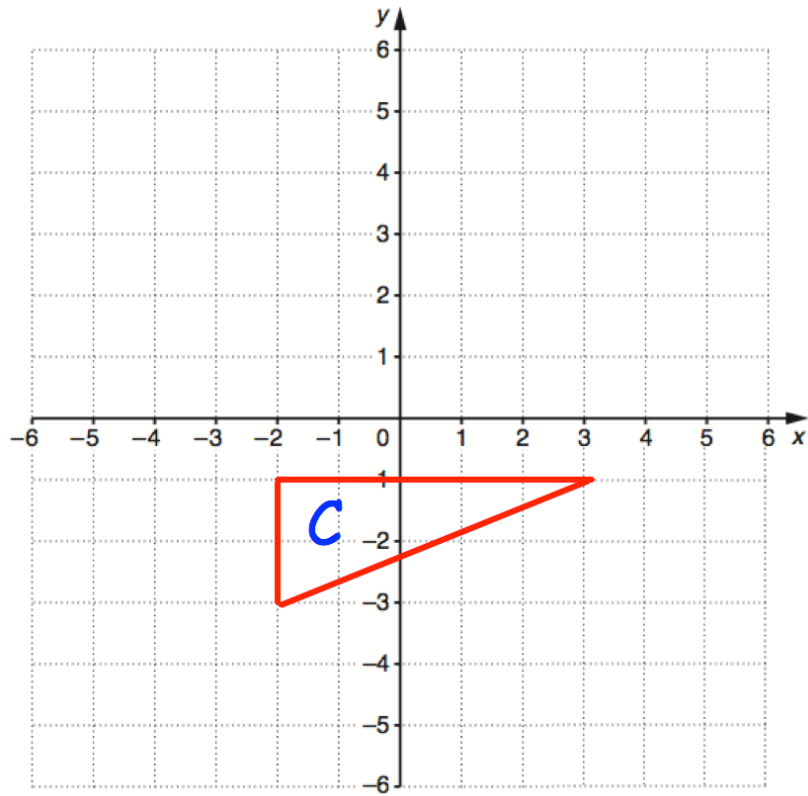
3.



Find x

.....°  
**(3)**

4.



Reflect triangle C in the line  $y = -x$

(2)

5. Jim is making green paint by mixing blue paint and yellow paint in the ratio 8:3

Jim has 120 litres of blue paint and 31.5 litres of yellow paint.

What is the maximum amount of green paint he can make?

.....litres

(3)

6.  $y$  is inversely proportional to  $x$

$x$	16	8	
$y$		10	20

Complete the table above

(2)

---

7.  $(ax^b)^3 = 27x^{12}$  where  $a$  and  $b$  are positive integers.

Work out  $a$  and  $b$

$a = \dots\dots\dots$

$b = \dots\dots\dots$

(2)

8. A group of friends have been surveyed.

38% have been to Canada.

80% have been to France.

11% have been to neither Canada or France.

Find the percentage of the group that have been to Canada and France.

.....%

**(4)**

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9. The equation of a circle C, with centre O, is:

$$x^2 + y^2 = 225$$

(a) Find the coordinates of the centre O.

(..... , .....)

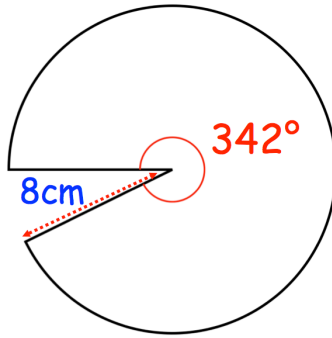
**(1)**

(b) Find the radius of C.

.....

**(1)**

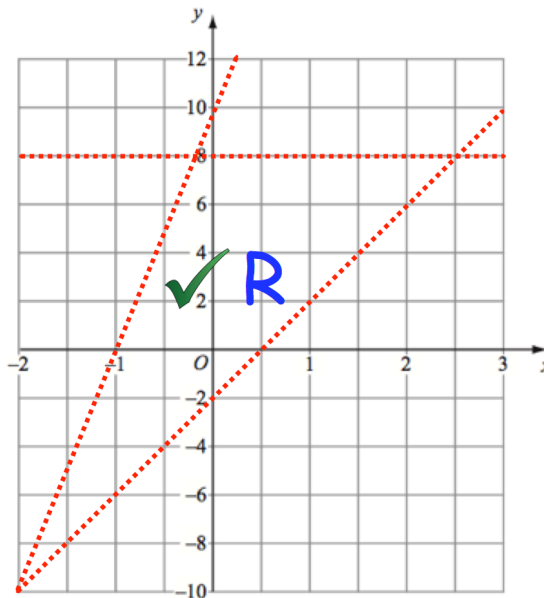
10.



Find the area of the sector above.  
Give your answer to 2 decimal places.

.....cm<sup>2</sup>  
**(3)**

11.



The region labelled R satisfies three inequalities.  
State the three inequalities.

.....  
.....  
.....  
**(3)**

12. Mrs Hampton is potting plants.  
She is using two mathematically similar pots, the smaller is 10cm tall and the larger 14cm tall.

She has three bags of soil, each containing 25 litres of soil.

With the first bag, Mrs Hampton fills 20 small pots using all of the soil in the bag.



How many large pots can be filled completely using the other two bags of soil?

.....  
(5)



13. Work out an expression for the  $n$ th term of this quadratic sequence

3    14    31    54    ...

Give your answer in the form  $an^2 + bn + c$

.....  
**(3)**

14. Jamie has some coins in his pocket.



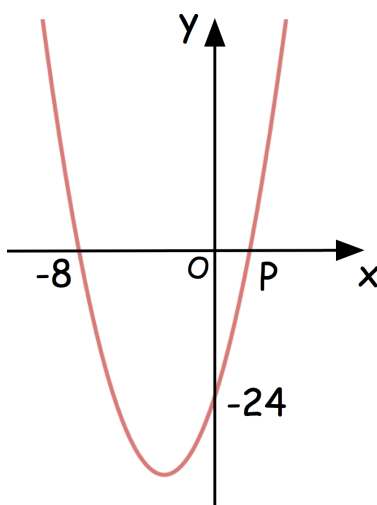
Jamie has to pay 60p for a car park ticket.  
He selects 3 coins at random, without replacement, from his pocket.

Work out the probability that he chooses the exact price of the ticket.

.....  
**(5)**

15. Below is a sketch of the graph  $y = x^2 + bx + c$

The curve passes through the points  $(-8, 0)$ ,  $(0, -24)$  and  $(P, 0)$



Work out the coordinates of the turning point of the graph.

.....  
(5)

16. (a) Show the equation  $x^3 + 3x^2 + 5 = 0$  can be rearranged to give

$$x = -3 - \frac{5}{x^2}$$

(b) Using  $x_{n+1} = -3 - \frac{5}{(x_n)^2}$

with  $x_0 = -4$

find the values of  $x_1$ ,  $x_2$  and  $x_3$

**(2)**

$$x_1 = \dots\dots\dots$$

$$x_2 = \dots\dots\dots$$

$$x_3 = \dots\dots\dots$$

**(3)**

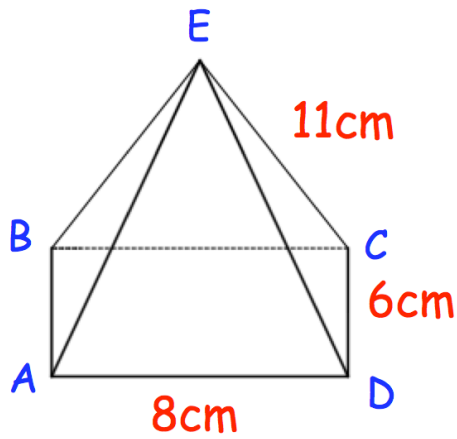
(c) Explain the relationship between the values of  $x_1$ ,  $x_2$  and  $x_3$  and the equation  $x^3 + 3x^2 + 5 = 0$

.....

.....

**(2)**

17. Shown below is a rectangular-based pyramid.  
The apex E is directly over the centre of the base.



AD = 8cm  
CD = 6cm  
CE = 11cm

- (a) Calculate the height of the pyramid

.....cm  
(3)

- (b) Calculate the angle between face ABE and the based ABCD

.....°  
(3)

18. Solve the equations

$$x^2 + y^2 = 25$$

$$x + y = 7$$

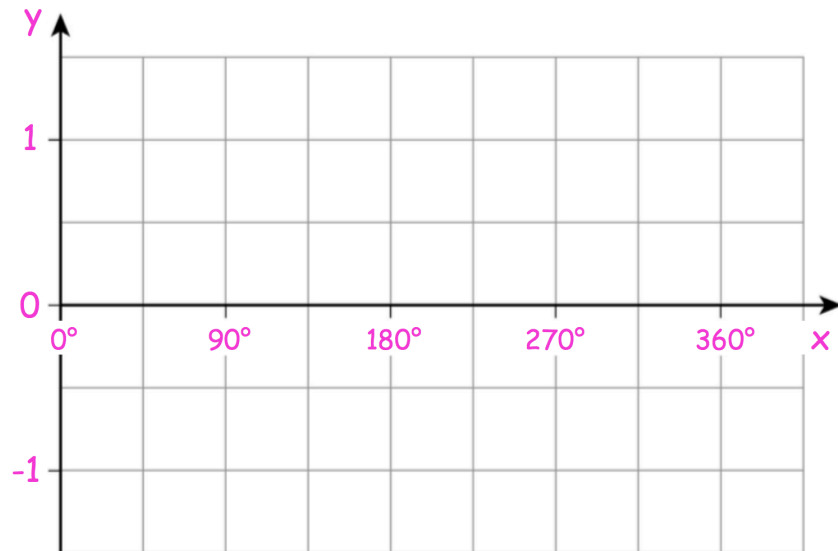
.....  
(5)

19. For all the values of  $x$

$$f(x) = x - 180$$

$$g(x) = \cos x$$

Draw the graph of the function  $y = gf(x)$  for  $0^\circ \leq x \leq 360^\circ$



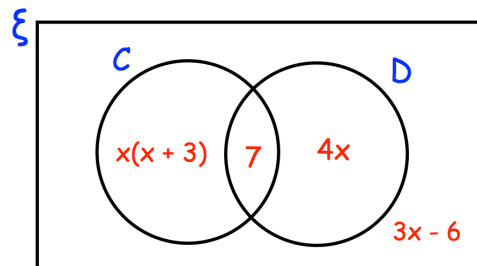
(2)

20. The Venn diagram shows information about the pets owned by 40 students

$\xi = 40$  students

C = students who own a cat

D = students who own a dog



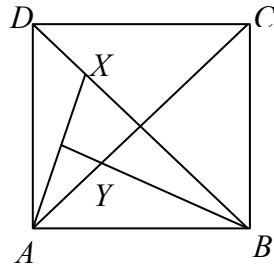
A student is chosen at random.

They own a cat.

Work out the probability that they own a dog.

.....  
(5)

- Q21. ABCD is a square, X is a point in the diagonal BD and the perpendicular from B to AX meets AC in Y.



Prove that triangles AXD and AYB are congruent.

(5)