LISTING COMBINATIONS

NAME: _____ CLASS: _____

1. A parking 'Pay Machine' takes **£2**, **£1**, and **50p** coins.

   John is due to pay a charge of **£3·50** for parking.
   One possible combination of coins John could use is shown in the table below.

   Complete the table to show all the possible combinations of coins that could be used.

£2	£1	50p
example: 0	3	1

2. Jill is giving change of **80 pence** to a customer.
   She has **50p**, **20p** and **10p** coins available.

   One possible combination of coins Jill could use is shown in the table below.
   Complete the table to show all the combinations of coins that are possible.

50p	20p	10p
example: 0	2	4

3. Show all ways of making **60 pence** using only **50p**, **20p**, and **10p** coins.

50p	20p	10p

4. In a competition darts are thrown at playing cards.

Points are scored as follows: **8 points** for hitting an **Ace**
6 points for hitting a **King**
5 points for hitting a **Queen**.

To win, a score of **over 17 points** is needed using **3 darts**.

One possible way of winning is shown in the table below.
Complete the table below to show all the ways of winning, including the points scored.

Ace (8 points)	King (6 points)	Queen (5 points)	points scored
example: 1	2	0	20

5. A transport lorry can carry **up to 5 containers** to a **maximum** load of **17 tonnes**.

Containers come in 3 types: container **A** weighs **5 tonnes**
container **B** weighs **4 tonnes**
container **C** weighs **3 tonnes**.

The table below is to show the 7 best combinations of containers, those that result in the greatest possible weight being carried. One of these combinations is shown in the table.

Complete the table, including the weights, by finding the other 6 best combinations.

A (5 tonnes)	B (4 tonnes)	C (3 tonnes)	weight (tonnes)
example: 2	0	2	16

6. Perfume can be bought as follows: a **300 gram** box for **£20**
   a **200 gram** box for **£11**
   a **100 gram** box for **£8**.

Tom wants to buy **700** grams of the perfume.
One possible combination of boxes Tom could buy is shown in the table below.

300g (£20)	200g (£11)	100g (£8)	COST (£)
example: 0	2	3	46

(a) Complete the table to show all the possible combinations of boxes that could be bought.

(b) Complete the cost column and so state the cheapest way to buy the powder.

7. The cost of printing photographs is: **£2·50** for a packet of **20** photos
   £1·90 for a packet of **15** photos
   £1·30 for a packet of **10** photos.

Karen wants to get **75** photos printed.
One possible combination of packets Karen could buy is shown in the table below.

20 photos (£2.50)	15 photos (£1.90)	10 photos (£1.30)	COST (£)
example: 0	3	3	9.60

(a) Complete the table to show all possible combinations of packets that could be bought.

(b) Complete the cost column and so state the cheapest way to buy the photos.

8. A company produces chocolate bars.

   Two types of chocolate bars are made: a **plain** bar costing **60 pence**

   a **milk** bar costing **50 pence**.

   A 'Special Pack' is being prepared which contains **at least one of each type of bar**.
   The value of the 'Special Pack' is to be **over £2 but less than £3**.

   One possible combination of bars is shown in the table below.

   Complete the table to show all possible combinations of bars that could be used.

plain bars (60p)	milk bars (50p)	'Special Pack' Cost (£)
example: 3	2	2.80

   The company decides to produce an 'Extra Special Pack'.
   The value of the 'Extra Special Pack' is still to be **over £2 but less than £3**.

   In the 'Extra Special Pack' each bar in the 'Special Pack' is wrapped with gift paper.
   This increases the cost by an **extra 10 pence for every bar** in the pack.

   In the example there are 5 bars in the pack adding 50 pence to the cost.
   The 'Extra Special Pack' would then cost £3·30 which is too much.

   Complete the table to show all the combinations of bars that can be used in the 'ES Pack'.

plain bars (60p)	milk bars (50p)	'ES Pack' Cost (£)

ANSWERS

1.

£2	£1	50p
example: 0	3	1
0	0	7
0	1	5
0	2	3
1	1	1

2.

50p	20p	10p
example: 0	2	4
0	0	8
0	1	6
0	3	2
0	4	0
1	1	1
1	0	3

3.

50p	20p	10p
0	0	6
0	1	4
0	2	2
0	3	0
1	0	1

4.

Ace (8 points)	King (6 points)	Queen (5 points)	points scored
example: 1	2	0	20
3	0	0	24
2	1	0	22
2	0	1	21
1	1	1	19
1	0	2	18
0	3	0	18

5.

A (5 tonnes)	B (4 tonnes)	C (3 tonnes)	weight (tonnes)
example: 2	0	2	16
1	0	4	17
0	2	3	17
2	1	1	17
1	3	0	17
0	1	4	16
1	2	1	16

6.(a)

300g (£20)	200g (£11)	100g (£8)	COST (£)
example: 0	2	3	46
0	0	7	56
0	1	5	51
0	3	1	41
1	1	2	47
1	2	0	42
2	0	1	48

(b) cheapest way to buy the powder: 3 of 200g and 1 of 100g

7.(a)

20 photos (£2.50)	15 photos (£1.90)	10 photos (£1.30)	COST (£)
example: 0	3	3	9.60
3	1	0	9.40
2	1	2	9.50
1	1	4	9.60
0	1	6	9.70
0	5	0	9.50

(b) cheapest way to buy the photos: 3 of 20 photos and 1 of 15 photos

8.

plain bars (60p)	milk bars (50p)	'Special Pack' Cost (£)
example: 3	2	2.80
3	1	2.30
2	3	2.70
2	2	2.20
1	4	2.60
1	3	2.10

plain bars (60p)	milk bars (50p)	'ES Pack' Cost (£)
3	1	2.70
2	2	2.60
1	3	2.50