1. Here are some bits of information about the first four players selected in an AFL football draft. For each player, use the clues and the grid provided to determine the order in which they were selected, their city of origin and their major hobby.

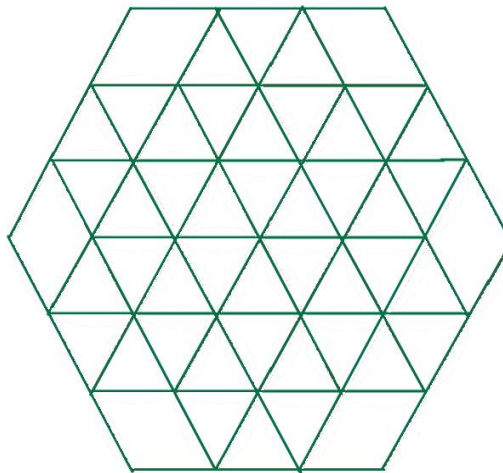|	Aaron	Beau	Cliff	Dan	fishing	cards	Painting	Games	Ballarat	Bendigo	Mildura	Sale
1st												
2nd												
3rd												
4th												
Ballarat												
Bendigo												
Mildura												
Sale												
fishing												
cards												
painting												
games												

i. The one selected first is a talented painter.

ii. The player who comes from Sale doesn't like computer games.

iii. Cliff was either the first or fourth to be selected.

iv. The computer game addict is Dan.

v. Aaron was selected before the keen fisherman.

vi. Cliff was selected before the young man from Bendigo.

vii. Of Cliff and the card player; one comes from Mildura; the other comes from Bendigo.
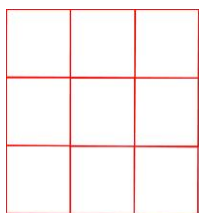
viii. Beau was not the fourth to be selected.

2. *How Many ....*
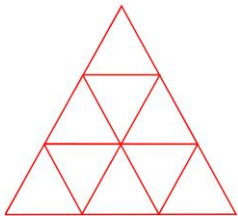
a. Triangles are there in total in this figure?

b. Squares are there in total in this figure?

c. Hexagons are there in total in this figure?

3. **Cats & Dogs**

A boarding kennel and cattery houses its animals in sectioned-off weather-proof sheds. Each shed can be adapted to house either dogs (maximum 8 dogs per shed) or cats (maximum 15 cats).
On one day, the sheds in use were all full, with 100 animals boarding.
How many sheds were in use?

4.

Four girls – Alice, Belle, Danielle and Kaye competed in a talent quest.
From the clues provided;

a. Place Alice, Belle and Danielle in the correct finishing order, 1st to 3rd.
b. List all four girls in ascending order of age.

- ○ Kaye was unplaced.
- ○ Alice is not the oldest, but is older than Danielle, who was not second.
- ○ The second-youngest girl finished second.
- ○ The child who placed third is older than the winner.
- ○ Belle is younger than the girl who finished third.

5.

PASS the PARCEL

Three speculators decided to invest in a parcel of shares. They agreed to each fund one third of the purchase price.

However, strategically it was decided that Aaron and Bryce should make the actual purchase. As Chrissie was well-known as a stock-market player, she would remain a silent partner in the venture.

Bryce eventually bought 7,500 shares whereas Aaron bought 4,500 shares at the same price.

Once the purchased shares were distributed among the three investors, Chrissie paid $140,000 dollars for her shares.

    (a)   What was the price per share?
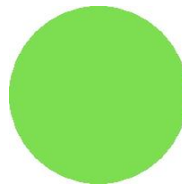   (b)   Of the $140,000 that Chrissie paid, how much went to Aaron, and how much went to Bryce?

Figure It Out

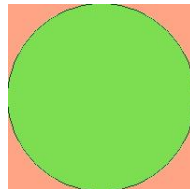**6.**

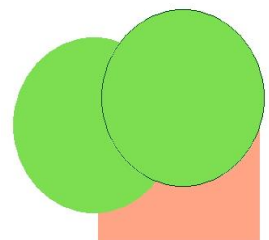This is a square   This is a circle.

It has the same diameter as the side of the square.

The circle does not quite cover the square.   You can still see some of it.

You would therefore will need two or more overlapping circles to cover the square. What is the minimum number of overlapping circles required to COMPLETELY cover the square?

7. Pencils & Jars
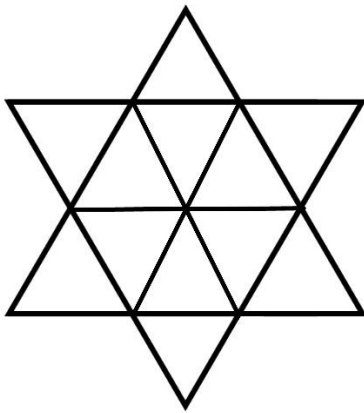
I have some pencils and some jars.

If I put thirteen pencils into each jar I will have four jars left over.

If I put seven pencils into each jar I will have eight pencils left over.

How many pencils and how many jars?

8. How Many Triangles?

What is the total number of triangles in this diagram?

9. I Scream for Ice Cream

I have a 5-scoop ice cream cone. Each of my 5 scoops is a different flavour of ice cream. The five flavours are blueberry, chocolate, strawberry, vanilla and bubble gum. You don't know what order my ice cream flavours are from top to bottom. However, here are some clues to see if you can work out, then write down out what the flavours are from top to bottom:

i. The bottom flavour has 10 letters.
ii. The vanilla scoop touches both the chocolate and blueberry scoop.
iii. Vanilla is below the chocolate scoop but above the bubblegum scoop.

10. Figure It Out

A street in a new housing estate has a house built on each block. The houses are numbered in the usual way. Each house has its street number prominently displayed on its letter box using one brass number for each digit. If **209** brass numbers were required to do this, how many houses are in the street?

Answers:

Worked solutions on the next page.

1. First selected was Cliff from Mildura who is a painter.
    Second was Aaron from Bendigo; he's the card player.
    Third was Beau from Sale who enjoys fishing.
    Fourth was Dan from Ballarat who plays computer games.

2. a. 13 triangles   b. 14 squares   c. 27 hexagons

3. 9 sheds

4. a. 1st Danielle, 2nd Belle, 3rd Alice
    b. Danielle, Belle, Alice, Kaye

5. (a) Price per share = $35
    (b) Chrissie pays Aaron $17,500   Chrissie pays Bryce $122,500

6. 4

7. 78 pencils, 10 jars

8. 20

9. top to bottom: Chocolate, Vanilla, Blueberry, Bubblegum, Strawberry

10. 104 houses

SOLUTIONS:

1. This puzzle falls out very quickly if you make best use of the clues supplied. Taking clues (i), (iii), (vi) and (vii) together, it's clear that Cliff was the first selected, therefore he's the painter and he comes from Mildura.

	Aaron	Beau	Cliff	Dan	fishing	cards	Painting	Games	Ballarat	Bendigo	Mildura	Sale
1st	X	X	✓	X	X	X	✓	X	X	X	✓	X
2nd			X				X				X	
3rd			X				X				X	
4th			X				X				X	
Ballarat			X				X	
Bendigo			X				X	
Mildura	X	X	✓	X	X	X	✓	X
Sale			X				X	
fishing			X	
cards			X	
painting	X	X	✓	X
games			X	

From clue (iv), Dan is the computer games player
From clue (vii), the card player comes from Bendigo.
From clue (ii), the player from Sale does not like computer games (so is not Dan)
From clues (v) & (viii), neither Beau nor Aaron is fourth, and we know Cliff is first, so the fourth selected, by elimination must be Dan (and he's the computer games player).

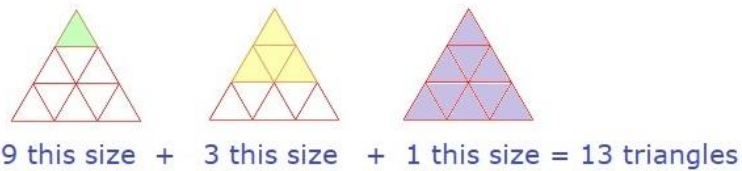|	Aaron	Beau	Cliff	Dan	fishing	cards	Painting	Games	Ballarat	Bendigo	Mildura	Sale
1st	X	X	✓	X	X	X	✓	X	X	X	✓	X
2nd			X	X			X	X			X	
3rd			X	X			X	X			X	
4th	X	X	X	✓	X	X	X	✓	🟨	X	X	X
Ballarat			X	🟨		X	X	🟨
Bendigo			X	X	X	✓	X	X
Mildura	X	X	✓	X	X	X	✓	X
Sale			X	X	🟨	X	X	X
fishing			X	X
cards			X	X
painting	X	X	✓	X
games	X	X	X	✓

By elimination (yellow squares above)
Dan is from Ballarat, and the fisherman comes from Sale

Finally, Clue (v) says that Aaron was selected before the fisherman. That puts them in second and third spots respectively. The grid can be completed from there.
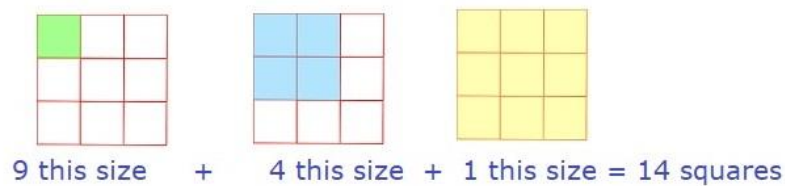
	Aaron	Beau	Cliff	Dan	fishing	cards	Painting	Games	Ballarat	Bendigo	Mildura	Sale
1st	X	X	✓	X	X	X	✓	X	X	X	✓	X
2nd	✓	X	X	X	X	✓	X	X	X	✓	X	X
3rd	X	✓	X	X	✓	X	X	X	X	X	X	✓
4th	X	X	X	✓	X	X	X	✓	✓	X	X	X
Ballarat	X	X	X	✓	X	X	X	✓				
Bendigo	✓	X	X	X	X	✓	X	X				
Mildura	X	X	✓	X	X	X	✓	X				
Sale	X	✓	X	X	✓	X	X	X				
fishing	X	✓	X	X								
cards	✓	X	X	X								
painting	X	X	✓	X								
games	X	X	X	✓								

2 (a)

9 this size + 3 this size + 1 this size = 13 triangles

2 (b)

9 this size + 4 this size + 1 this size = 14 squares
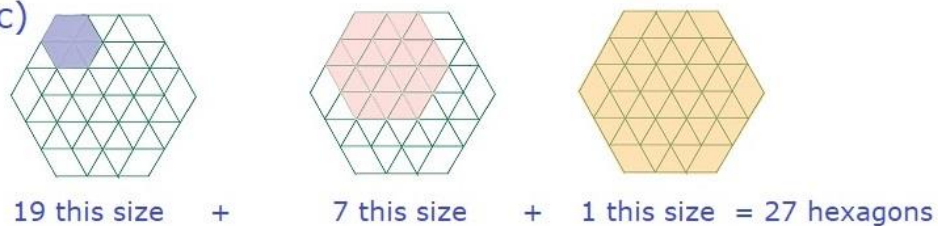
2 (c)

19 this size + 7 this size + 1 this size = 27 hexagons

3. The only combination of 100 cats and dogs which will exactly fill a certain number of sheds is (4 X 15) = 60 cats + (5 X 8) = 40 dogs.

4. One approach is to begin with all possibilities shown in a table, then to use the clues for elimination purposes.

1st	Alice Belle Danielle	Oldest, 2nd Oldest, 2nd Youngest, Youngest
2nd	Alice Belle Danielle	Oldest, 2nd Oldest, 2nd Youngest, Youngest
3rd	Alice Belle Danielle	Oldest, 2nd Oldest, 2nd Youngest, Youngest
unplaced	KAYE	Oldest, 2nd Oldest, 2nd Youngest, Youngest

Danielle was not second. The second-youngest girl finished second

1st	Alice Belle Danielle	Oldest, 2nd Oldest, Youngest
2nd	Alice Belle	**2ND YOUNGEST**
3rd	Alice Belle Danielle	Oldest, 2nd Oldest, Youngest
unplaced	**KAYE**	Oldest, 2nd Oldest, Youngest

The child who placed third is older than the winner.

1st	Alice Belle Danielle	2nd Oldest, Youngest
2nd	Alice Belle	**2ND YOUNGEST**
3rd	Alice Belle Danielle	Oldest, 2nd Oldest,
unplaced	**KAYE**	Oldest, 2nd Oldest, Youngest

Belle is younger than the girl who finished third

| 1st	Alice Belle Danielle	2nd Oldest, Youngest
2nd	Alice Belle	**2ND YOUNGEST**
3rd	Alice Danielle	Oldest, 2nd Oldest,
unplaced	**KAYE**	Oldest, 2nd Oldest, Youngest

Alice is not the oldest, but is older than Danielle, who was not second. Danielle therefore is not oldest or second-oldest. Danielle therefore was not placed third. By default, she placed first and was the youngest. Alice therefore came third, and Belle came second. As Alice is not the oldest, she is 2nd oldest and Kaye is oldest.

1st	**DANIELLE**	**YOUNGEST**
2nd	**BELLE**	**2ND YOUNGEST**
3rd	**ALICE**	**2ND OLDEST**
unplaced	**KAYE**	**OLDEST**

5. (a) A total of 12,000 shares were purchased. Since Chrissie's outlay of $140,000 represented one-third of the total cost, the price per share was (420,000 / 12,000) or $35/share.
   (b) Aaron's initial outlay was (35 X 4,500) = $157,500
       Bryce's initial outlay was (35 X 7,500) = $262,500
       Chrissie pays Aaron (157,500 – 140,000) = $17,500
       Chrissie pays Bryce (262,500 = 140,000) = $122,500

6. The diagram on the left demonstrates that four such circles can completely cover the square with some overlap. However, if fewer than four circles are used, some exposed portion of the square will always be visible.
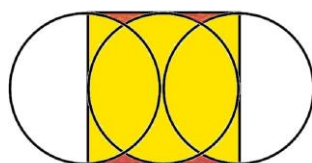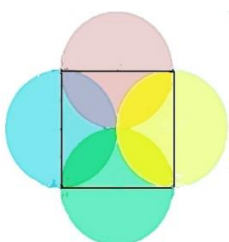
7. Let the number of pencils be **p**, and the number of jars **j**.

    $j = p/13 + 4$ {equation 1}

    $p = 7j + 8$ {equation 2}

                  substitute ($7j + 8$) for **p** in equation 1

$j = \dfrac{(7j + 8)}{13} + 4$

$j - 4 = \dfrac{(7j + 8)}{13}$

$13(j - 4) = 7j + 8$
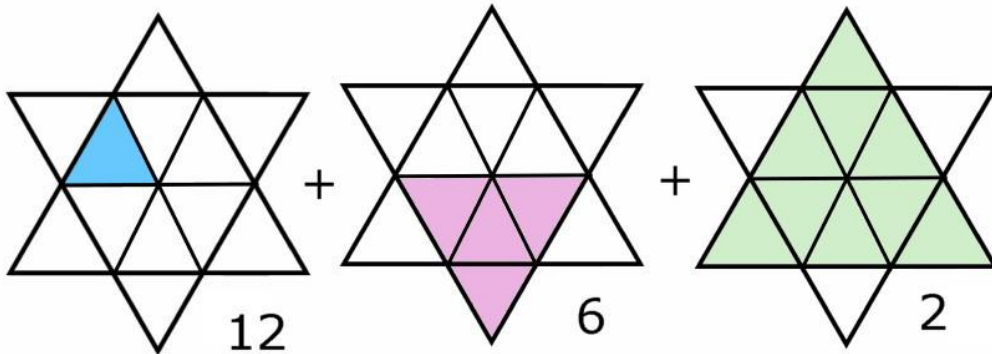
$13j - 52 = 7j + 8$

$6j = 60$

$j = 10$ (there are 10 jars) - substitute 10 for j in equation 2

$p = (7 \times 10) + 8$ (there are 78 pencils)

8.

How Many triangles? Solution

9. Clue (i) The bottom flavour has 10 letters. Only Strawberry qualifies.

top	Chocolate, Vanilla, Blueberry, Bubblegum
	Chocolate, Vanilla, Blueberry, Bubblegum
	Chocolate, Vanilla, Blueberry, Bubblegum
	Chocolate, Vanilla, Blueberry, Bubblegum
bottom	**STRAWBERRY**

Clue (iii) Vanilla is below the chocolate scoop but above the bubblegum scoop

top	Chocolate, ~~Vanilla~~, Blueberry, ~~Bubblegum~~
	Chocolate, Vanilla, Blueberry, ~~Bubblegum~~
	~~Chocolate~~, Vanilla, Blueberry, Bubblegum
	~~Chocolate~~, ~~Vanilla~~, Blueberry, Bubblegum
bottom	**STRAWBERRY**

Clue (ii). The vanilla scoop touches both the chocolate and blueberry scoop. That means that chocolate, vanilla and blueberry in that order are consecutive layers from top to bottom.
That is only possible if chocolate is the top layer, vanilla the second layer and blueberry the third layer, otherwise there is no layer available for bubblegum.

top	Chocolate, ~~Blueberry~~
	~~Chocolate~~, Vanilla, ~~Blueberry~~
	~~Vanilla,~~ Blueberry, ~~Bubblegum~~
	~~Blueberry,~~ Bubblegum
bottom	**STRAWBERRY**

10.

House numbers	Brass numbers required
1-9	9
10-99	180
100-104	20
TOTAL	**209**