Sample Exam 9: Unequal Sharing Worksheet – Solutions
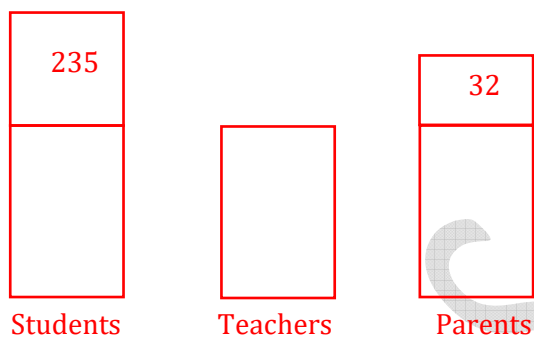
Session 9   **Total: 75 marks**

1. At a school event, the total number of students, parents and teachers who attended was 465. The number of students was 235 more than the number of teachers. The number of teachers was 32 less than the number of parents.

   How many teachers attended the event?   [2]

Remove the excess $= 465 - (235 + 32)$

$$= 465 - 267$$

$$= 198$$

3 blocks $= 198$

1 block $= \dfrac{198}{3}$

$= 66$ persons

Number of teachers $= 66$ teachers
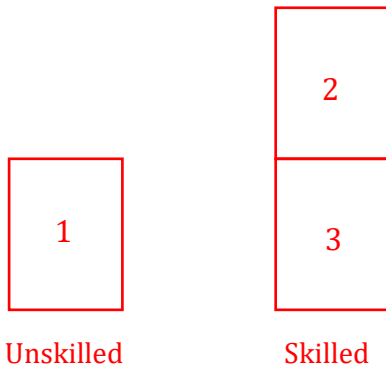
Answer_____ 66 _____ teachers

2. A factory has 384 workers. The number of skilled workers employed at the factory was double the number of unskilled workers. The workers are divided into 16 groups, with each group having the same number of skilled and unskilled workers.

How many unskilled workers are there in each group? [2]

There were 384 workers in total.

Unskilled   Skilled

Number of boxes $= 3$

Number of workers in one box $= \dfrac{384}{3}$

$$= 128 \text{ workers}$$

Number of unskilled workers $= 128$ workers

Number of unskilled workers in each group $= \dfrac{Number\ of\ unskilled\ workers}{Number\ of\ groups}$

$$= \dfrac{128}{16}$$

$$= 8 \text{ workers}$$

Answer_____ 8 _____ workers

3. In a pet store, there are two aquariums with the same number of fish. At the end of the week, the first aquarium had 56 fish and the second aquarium has 68 fish. The number of fish removed from the first aquarium was twice the number of fish removed from the second aquarium.

How many fish were originally in each aquarium? [2]

| 56 | 68 |
| Aquarium 1 | Aquarium 2 |
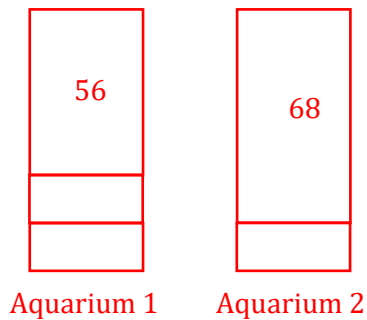
$1 \text{ block} = 68 - 56$

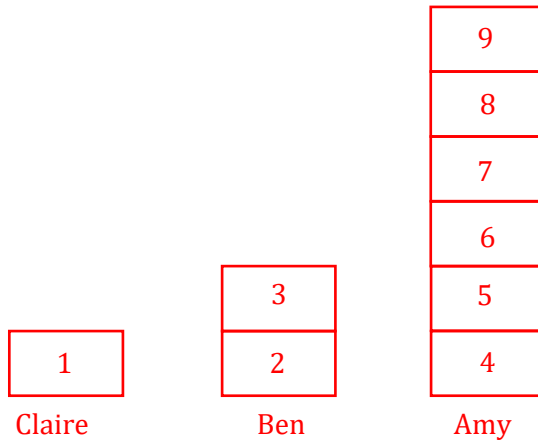$= 12 \text{ fish}$

At first, Aquarium $1 = 12 + 12 + 56$

$= 80 \text{ fish}$

At first, Aquarium $2 = 12 + 68$

$= 80 \text{ fish}$

Answer_____ 80 _____ fish

4. A charity organization received a donation of 207 blankets from three donors: Amy, Ben, and Claire. Amy donated 3 times more blankets than Ben. Ben donated 2 times more blankets than Claire. How many blankets did Amy donate more than Claire? [3]

		9
		8
		7
		6
	3	5
1	2	4
Claire	Ben	Amy

Claire = 1 donation

Ben = 2 donations

Amy = 6 donations (3 times more than Ben, who donated 2 times more than Claire)

So, there are 9 shares in total.

9 blocks = 207 blankets

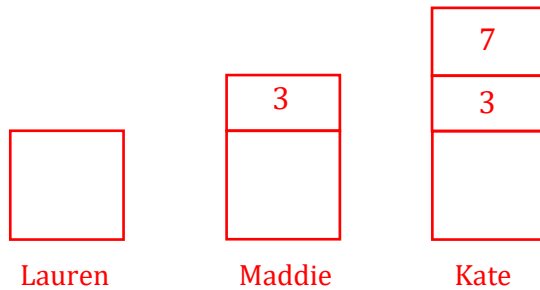1 block = $\frac{207}{9}$

= 23 blankets

Amy donated = 23 × 6

= 138 blankets

Number of blankets Amy donated more than Claire = 138 − 23

= 115 blankets

Answer_____ 115 _____ blankets

5. Three friends share 37 flowers among themselves. Kate got 7 more than Maddie who got 3 more than Lauren. How many flowers did Lauren get? [2]

	7
	3	3
Lauren	Maddie	Kate

Remove the excess:

Excess $= 37 - (3 + 3 + 7)$

$= 37 - 13$

$= 24$

Share the remainder:

Remainder $= 24 \div 3$

$= 8$

Lauren got 8 flowers.

Answer_____ 8 _____ flowers

6. A bakery sells cakes and cookies. Each cake costs $22.50 more than each cookie. If Sarah spent $245 for 4 cakes and 6 cookies, how much does each cookie cost? [3]

Remove the excess:

Excess = $22.50 × 4

        = $90

Therefore, $245 − $90 = $155.

Share the remainder:

Remainder = $155

Therefore,

$155 ÷ 10 = $15.50

So, each cookies costs $15.50.

Answer $_____ 15.50 _____

7. A company consists of three types of workers: managers, part-time employees and full-time employees. 40% of the employees are part-time and 20% of the remainder are managers. Given that there are 288 full-time employees, find the number of employees (part-time and full-time) in the company and the number of managers. [4]

Part-time employees $= 40\%$

Remainder $= 100\% - 40\%$

$\qquad = 60\%$

Managers $= 20\%$ of the remainder

$\qquad = 20\%$ of 60%

$\qquad = \frac{20}{100} \times \frac{60}{1}$

$\qquad = 12\%$

Full-time employees $= 60\% - 12\%$

$\qquad\qquad = 48\%$

$48\% = 288$

Total persons at the company $= \frac{288}{1} \div \frac{48}{100}$

$\qquad\qquad\qquad = \frac{288}{1} \times \frac{100}{48}$

$\qquad\qquad\qquad = 600$

40% part-time $+ 48\%$ full-time $= 88\%$ of 600

Number of employees $= \frac{88}{100} \times \frac{600}{1}$

$\qquad\qquad = 528$

Number of managers $= \frac{12}{100} \times 600$

$$= 72$$

Answer_____ 528 employees and 72 managers _____

8. A grocery store has 180 fruits on display consisting of apples, oranges and bananas. There are 72 apples and an equal number of oranges and bananas.

Calculate the percentage of oranges that are on display. [3]

Total number of fruits = 180

Total number of apples = 72

Therefore, the number of oranges and bananas = 180 − 72

$$= 108$$

The number of oranges is the same as the number of bananas.

So, the number of oranges = 108 ÷ 2

$$= 54$$

Percentage of oranges = $\frac{Number\ of\ oranges}{Total\ number\ of\ fruits} \times 100\%$

$$= \frac{54}{180} \times \frac{100}{1}$$

$$= 30\%$$

Answer_____ 30 _____ %

9. Lizzie measures the heights of an oak tree and a cedar tree.

The total height of the two trees is 16.4 metres.

If the oak tree is 3.8 metres taller than the cedar tree, what is the height of the cedar tree?   [2]

3.8 m

Oak   Cedar
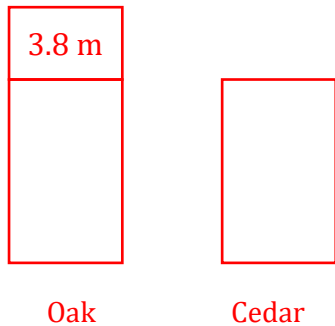
Total = 16.4 m

Remove excess = 16.4 − 3.8

= 12.6 m

2 blocks = 12.6

1 block = $\frac{12.6}{2}$

= 6.3 m

Therefore, the cedar tree is 6.3 m.

Answer_____ 6.3 _____ metres

10. Three siblings, Sarah, Mike, and Amanda are sharing a bag of candy. Sarah took 87 pieces, Mike took 75 pieces, and Amanda took 30 pieces. How many pieces of candy should Sarah and Mike give to Amanda so that each sibling has an equal number of candies? [4]

Total number of candies $= 87 + 75 + 30$

$$= 192 \text{ candies}$$

To have the same number of candies, each sibling must have $= \frac{192}{3}$

$$= 64 \text{ candies}$$

So, Sarah must give $87 - 64 = 23$ candies and remain with 64 candies.

And Mike must give $75 - 64 = 11$ candies and remain with 64 candies.

So, Amanda will then have $30 + 23 + 11 = 64$ candies.

Answer_____ Sarah must give 23 candies and Mike must give 11 candies _____

11. The combined weight of a backpack, a suitcase, and a duffel bag is 56 kg. The suitcase is 5 kg heavier than the backpack, and the backpack is 12 kg lighter than the duffel bag.

(a) What is the weight of the duffel bag? [2]
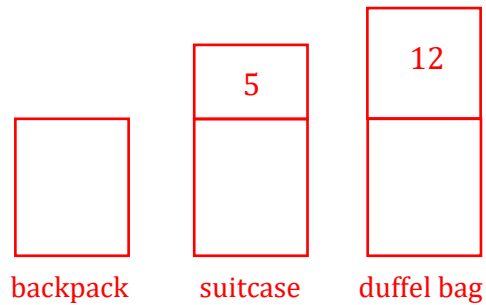
Remove excess $= 56 - (5 + 12)$

$= 56 - 17$

$= 39$ kg

3 blocks $= 39$ kg

1 block $= \dfrac{39}{3}$

$= 13$ kg

Weight of duffel bag $= 13 + 12$

$= 25$ kg

Answer_____ 25_____ kg

(b) What is the weight of the suitcase? [1]

Weight of suitcase $= 13 + 5$

$= 18$ kg

Answer_____ 18 _____ kg

12. The sum of two numbers is 198. The larger number is 5 times the smaller number.

What is the value of the larger number? [2]

5
4
3
2
1

Larger number

6
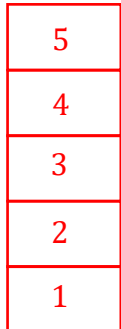
Smaller number

6 blocks = 198

1 block = 198 ÷ 6

= 33

Smaller number = 33

Larger number = 33 × 5

= 165

Answer_____ 165 _____

13. Mr. and Mrs. Johnson want to divide 180 chocolate bars among their three children, with the oldest getting three times as many as the youngest, and the middle child getting twice as many as the youngest. How many chocolate bars did each child receive?   [4]

		6
	3	5
1	2	4
Youngest	Middle	Oldest
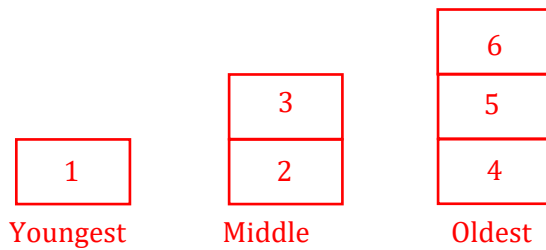
Total shares = 6 shares

Total number of chocolate bars = 180 chocolate bars

Therefore,

Youngest = $\frac{1}{6} \times 180$

        = 30 chocolate bars

Middle = $\frac{2}{6} \times 180$

        = 60 chocolate bars

Oldest = $\frac{3}{6} \times 180$
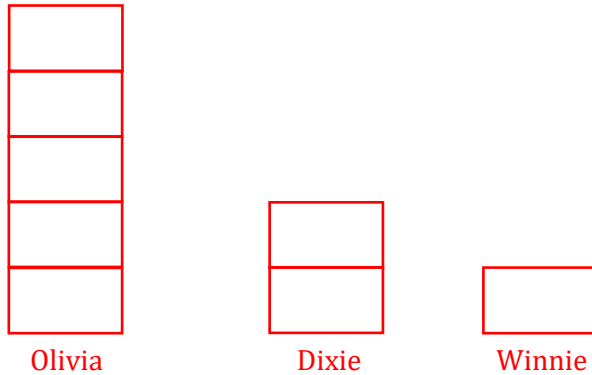
        = 90 chocolate bars

Answer Youngest received 30 chocolate bars,

        Middle received 60 chocolate bars

        Oldest received 90 chocolate bars

14. Dixie has 40% of the number of paperclips Olivia has. Winnie has $\frac{1}{2}$ of the number of paperclips Dixie has. If Olivia has 56 paperclips more than Winnie, how many paperclips does Dixie has? [4]

Olivia   Dixie   Winnie

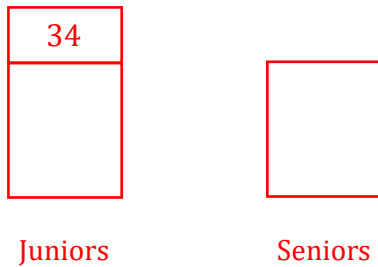Olivia has 4 more parts than Winnie.

4 blocks = 56 paperclips

1 block = $\frac{56}{4}$

= 14 paperclips

Dixie has = 14 × 2

= 28 paperclips

Answer_____ 28 _____ paperclips

15. The number of pens owned by the seniors and juniors of a company sum to 260. The seniors have 34 less pens than the juniors. How many pens do the juniors have? [2]

34

Juniors   Seniors

Remove the excess:

Excess $= 260 - 34$

$\qquad = 226$

Share the remainder:

Remainder $= \frac{226}{2}$

$\qquad\quad = 113$

Add back excess:

Number of pens the juniors have $= 113 + 34$

$\qquad\qquad\qquad\qquad\qquad = 147$ pens

Answer_____ 147 _____ pens

16. Jasmine went to the grocery store to buy fruits and vegetables. Each pound of fruits costs $7.00 and each pound of vegetables costs $9.00. She bought 5 more pounds of fruits than vegetables and spent a total of $131.00. How many pounds of fruits did she buy? [3]

Remove the excess:

Excess = $7 per pound of fruits × 5

$\qquad$ = $35

Therefore, $131 − $35 = $96.

Share the remainder:

Remainder = $96

Therefore,

$96 ÷ ($7 + $9) = $96 ÷ $16

$\qquad\qquad\qquad$ = 6 of EACH

We have 6 pounds of EACH (6 pounds of fruits and 6 pounds of vegetables).

Add back excess:

Number of pounds of fruits = 6 + 5

$\qquad\qquad\qquad$ = 11 pounds

Answer_____ 11 _____ pounds

17. In a baking competition, Fiona baked 95 cupcakes. She baked $\frac{5}{8}$ of the number of cupcakes Debbie baked. How many cupcakes did they bake altogether? [3]

We do not know the number of cupcakes Debbie baked but we know $\frac{5}{8}$ of the number of cupcakes Debbie baked. So, we represent Debbie's cupcakes as a whole, divided into 8 parts.

Debbie	Fiona
$\frac{1}{8}$	
$\frac{1}{8}$	
$\frac{1}{8}$	
$\frac{1}{8}$	$\frac{1}{8}$
$\frac{1}{8}$	$\frac{1}{8}$
$\frac{1}{8}$	$\frac{1}{8}$
$\frac{1}{8}$	$\frac{1}{8}$
$\frac{1}{8}$	$\frac{1}{8}$
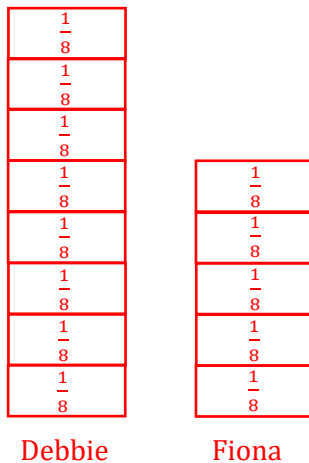
$\frac{5}{8}$ of Debbie's cupcakes $= 95$

$\frac{1}{8}$ of Debbie's cupcakes $= 95 \div 5$

$= 19$

$\frac{8}{8}$ of Debbie's cupcakes $= 19 \times 8$

$= 152$

Number of cupcakes they baked altogether $= 152 + 95$

$= 247$ cupcakes

Answer_____ 247 _____ cupcakes

18. A library has 690 books altogether. There are 150 children fiction books and 320 adult fiction books.

The number of adult non-fiction books is three times the number of children non-fiction books.

How many adult books are in the library?   [3]

children fiction   adult fiction   adult non-fiction   children non-fiction
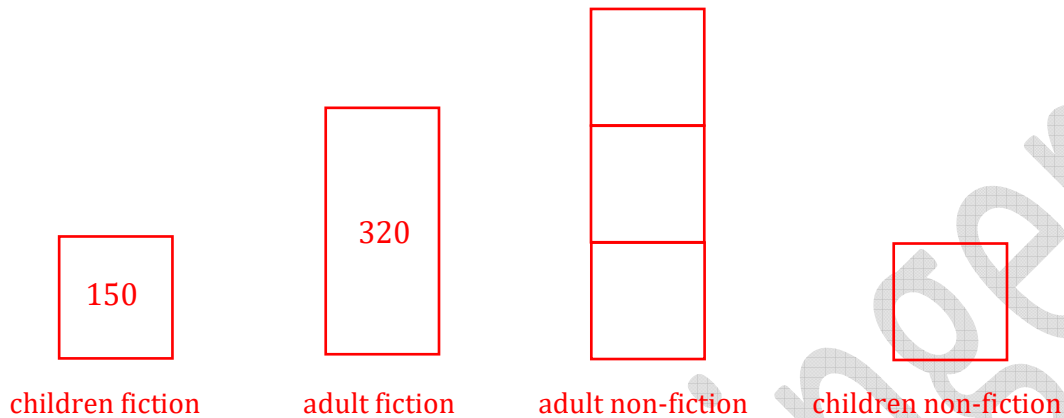
Add up number of fiction books = 150 + 320

= 470 fiction books

Number of non-fiction books = 690 − 470

= 220 non-fiction books

4 parts = 220

1 part = $\frac{220}{4}$

= 55 non-fiction books

Total number of adult books = 320 + (3 × 55)

= 320 + 165

= 485 adult books

Answer_____ 485 _____books

19. Mark is 4 years old and has two siblings. The sum of his siblings' ages is three times that of Mark's age. His brother is 6 years older than his sister. How old is Mark's brother? [3]
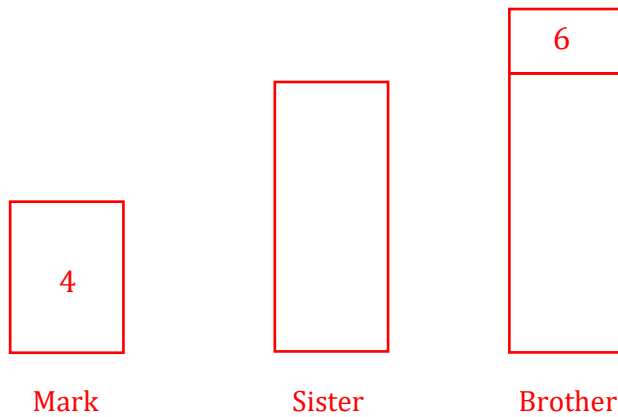
Mark's age = 4 years

Sum of siblings' ages = 3×4

$\qquad = 12$

Remove excess = $12 - 6$

$\qquad = 6$

One box = $\dfrac{6}{2}$

$\qquad = 3$ years

Brother's age = $3 + 6$

$\qquad = 9$ years

Answer_____ 9 _____ years

20. Three friends, Alex, Bob and Charlie, went to the movies. Alex paid $11 more than Bob. He also paid twice as much as Charlie. Together they paid $84. How much did Alex contribute?   [3]
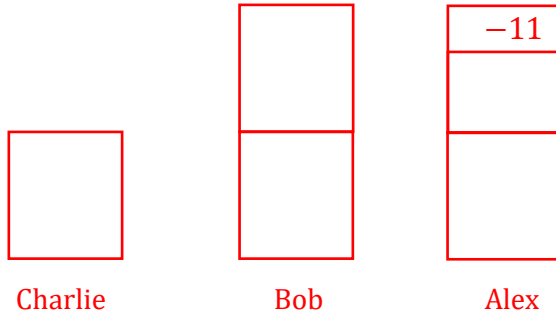
Charlie   Bob   Alex

Add back = $84 + $11

= $95

5 blocks = $95

1 block = $95 ÷ 5

= $19

Alex doubled the amount Charlie contributed (which is represented by 1 block).

Amount Alex contributed = $19 × 2

= $38

Answer $_____ 38 _____

21. James and Nathan are playing a game where they score points for each successful attempt. James scores 18 more points than Nathan. If the total points scored by them is 162, how many points did Nathan score? [3]

Remove the excess:

Excess $= 162 - 18$

$= 144$ points

Share the remainder:

Remainder $= 144 \div 2$

$= 72$ points

Nathan scored $= 72$ points

Answer_____ 72 _____ points

22. In a zoo, there are 375 animals in total. Of these $\frac{1}{5}$ are birds (baby birds and adult birds) and the others are mammals (baby and adults).

There are three times as many adult mammals as baby mammals.

The number of baby birds is equal to $\frac{7}{15}$ the number of baby mammals.

How many baby birds are in the zoo? [4]

Number of birds $= \frac{1}{5} \times 375$

$= 75$ birds

Number of mammals $= 375 - 75$

$= 300$ mammals

Therefore, 300 are baby mammals and adult mammals, but there are three times as many adult mammals as baby mammals.

4
3

1		2

Baby mammals   Adult mammals
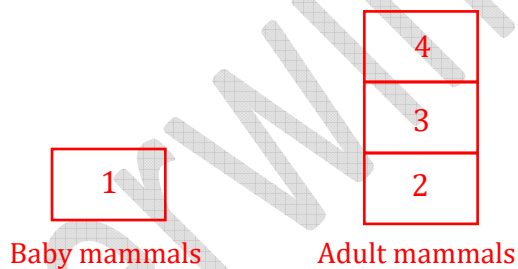
4 blocks $= 300$

1 block $= \frac{300}{4}$

$= 75$

Therefore, the number of baby mammals is 75.

Number of baby birds $= \frac{7}{15} \times$ number of baby mammals

$$= \frac{7}{15} \times 75$$

$$= 35 \text{ baby birds}$$
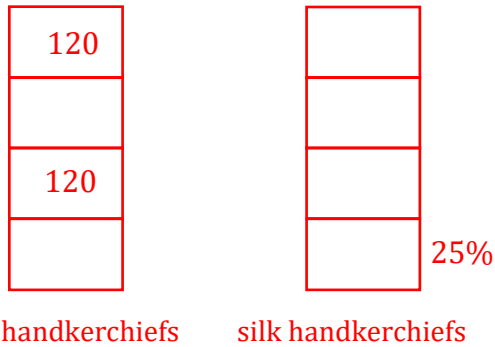
Answer_____ 35 _____ baby birds

23. There are 690 handkerchiefs (linen and silk) in a store. Half of the linen handkerchiefs is 120 more than 25% of the silk handkerchiefs. How many silk handkerchiefs are there in the store?   [4]

120
120

linen handkerchiefs

	25%

silk handkerchiefs

$\text{Excess} = 120 \times 2$

$\qquad = 240$

$\text{Remainder} = 690 - 240$

$\qquad = 450$

$6 \text{ blocks} = 450$

$1 \text{ block} = \dfrac{450}{6}$

$\qquad = 75$

$\text{Number of silk handkerchiefs} = 75 \times 4$

$\qquad = 300 \text{ silk handkerchiefs}$

Answer_____ 300 _____ silk handkerchiefs

24. According to a recipe for fruit punch, for every 4 cups of orange juice, 3 cups of pineapple juice and 9 cups of water are used. How many cups of each ingredient were used if this recipe was followed throughout the day, taking into account that there were 144 cups total? [3]

Number of cups of orange juice = 4 cups

Number of cups of pineapple juice = 3 cups

Number of cups of water = 9 cups

Number of cups used together = 4 + 3 + 9

$$= 16 \text{ cups}$$

Overall combined cups = 144 cups

Therefore,

Number of cups of orange juice $= \frac{4}{16} \times 144$

$$= 36 \text{ cups}$$

Number of cups of pineapple juice $= \frac{3}{16} \times 144$

$$= 27 \text{ cups}$$

Number of cups of water $= \frac{9}{16} \times 144$

$$= 81 \text{ cups}$$

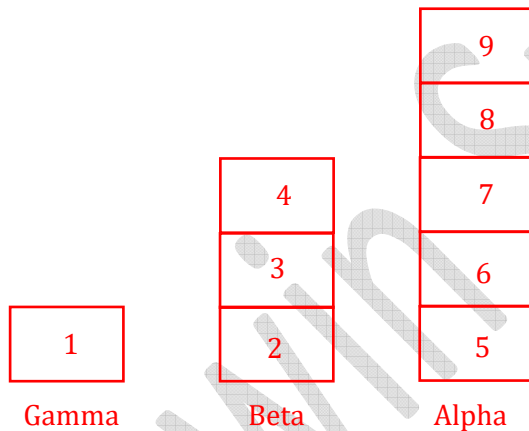Answer 36 cups of orange juice

27 cups of pineapple juice

81 cups of water

25. 126 balloons are shared equally among 3 teams: Team Alpha, Team Beta and Team Gamma.

   (a) How many balloons does each team receive?   [1]

   Each team receives $= 126 \div 3$

   $\qquad\qquad\qquad\quad = 42$ balloons

   Answer_____ 42 _____ balloons

   (b) If instead they shared it where Team Beta got three times more balloons than Team Gamma and Team Alpha got 5 times more than Team Gamma, how were the balloons divided?   [3]

```
                              ┌─────┐
                              │  9  │
                              ├─────┤
                              │  8  │
                    ┌─────┐   ├─────┤
                    │  4  │   │  7  │
                    ├─────┤   ├─────┤
                    │  3  │   │  6  │
          ┌─────┐   ├─────┤   ├─────┤
          │  1  │   │  2  │   │  5  │
          └─────┘   └─────┘   └─────┘
          Gamma      Beta      Alpha
```

   Total shares $= 9$ shares

   Therefore,

   Team Gamma got $= \frac{1}{9} \times 126$

   $\qquad\qquad\qquad = 14$ balloons

   Team Beta got $= \frac{3}{9} \times 126$

   $\qquad\qquad\qquad = 42$ balloons

Team Alpha got $= \frac{5}{9} \times 126$

$\qquad\qquad = 70$ balloons

Answer Team Alpha got 70 balloons.

Team Beta got 42 balloons.

Team Gamma got 14 balloons.