Sample Exam 8: Unequal Sharing Worksheet - Solutions
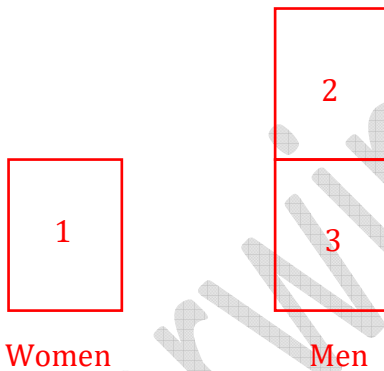
Session 8   **Total: 75 marks**

1. A company has 273 employees. There were twice as many men as there were women.

    The employees were divided into 13 teams with each team having the same number

    of men and the same number of women.

    How many men were there in each team?   [2]

    There are 273 employees in total.

	2
1	3
Women	Men

    Number of boxes = 3

    Number of employees in one box $= \dfrac{273}{3}$

    $\qquad\qquad\qquad = 91$ employees

    Number of women in company $= 91$ women

    Number of men in company $= 91 \times 2$

$$= 182 \text{ men}$$

$$\text{Number of men in one team} = \frac{\text{Number of men in company}}{\text{Number of teams}}$$
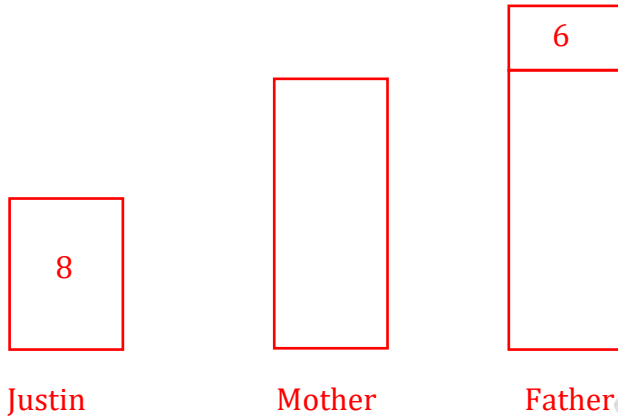
$$= \frac{182}{13}$$

$$= 14 \text{ men}$$

Answer: 14 men

2. Justin is 8 years old. The sum of his parents' ages is the square of Justin's age. His mother is 6 years younger than his father. How old is Justin's father?   [3]

8		6
Justin	Mother	Father

Justin's age = 8 years

Sum of parents' ages = 8^2

$$= 8 \times 8$$

$$= 64$$

Remove excess = 64 − 6

$$= 58$$

One box = $\frac{58}{2}$

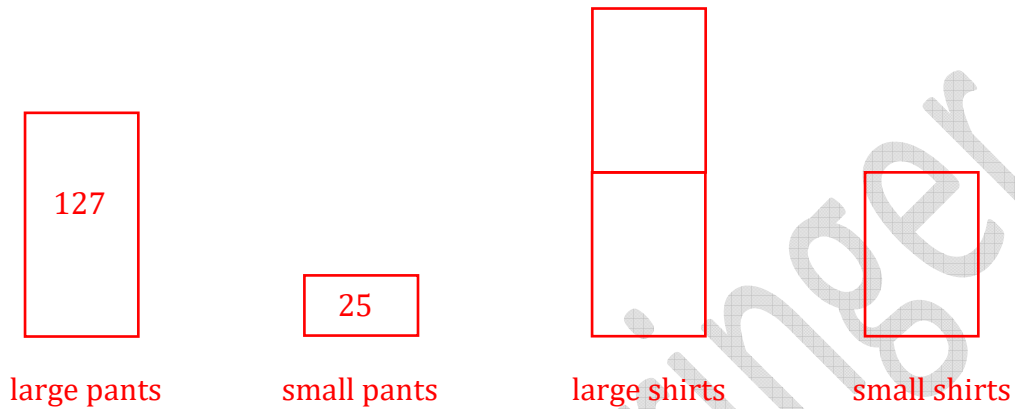$$= 29 \text{ years}$$

Father's age = 29 + 6

$$= 35 \text{ years}$$

Answer: Justin's father is 35 years old.

3. In a store, there were 512 pants and shirts altogether. There were 127 large pants and 25 small pants. The number of large shirts was twice the number of small shirts. What was the total number of clothes in size small at the store? [3]

127			
large pants	small pants	large shirts	small shirts

25

Add up pants $= 127 + 25$

$= 152$ pants

Subtract excess $= 512 - 152$

$= 360$ shirts

3 parts $= 360$

1 part $= \dfrac{360}{3}$

$= 120$ small shirts

Total number of small clothes $= 120 + 25$

$= 145$ small clothes

Answer: The total number of clothes in size small at the store is 145.

4. The combined weight of Miley and Jade's suitcases is 48.3 kg. If Miley's suitcase is

4.7 kg heavier than Jade's, how much does Jade's suitcase weigh?　　　[2]

4.7 kg

Miley　　　Jade
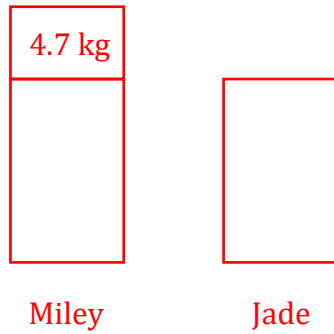
Total = 48.3 kg

Remove excess = 48.3 − 4.7

= 43.6 kg

2 blocks = 43.6

1 block = $\frac{43.6}{2}$

= 21.8 kg

Answer: Jade's suitcase weighs 21.8 kg.

5. Three students Lucas, Elliot and Ivy completed a test. Lucas scored 6 marks more than Elliot. He also doubled Ivy's score. Together the students have 59 marks. How many marks did Lucas score? [3]

Ivy   Elliot   Lucas
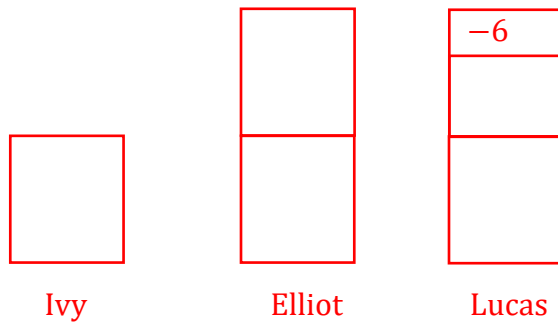
$$\text{Add back} = 59 + 6$$

$$= 65 \text{ marks}$$

$$5 \text{ blocks} = 65$$

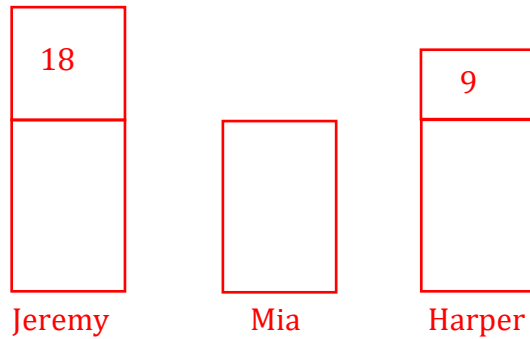$$1 \text{ block} = \frac{65}{5}$$

$$= 13 \text{ marks}$$

Lucas doubled Ivy's score (which is represented by 1 block).

$$\text{Number of marks scored by Lucas} = 13 \times 2$$

$$= 26 \text{ marks}$$

Answer: Lucas scored 26 marks.

6. At the beach, Jeremy, Mia and Harper collected 123 seashells altogether. Jeremy collected 18 more seashells than Mia. Mia collected 9 fewer than Harper. How many seashells did Harper collect? [2]

Remove the excess $= 123 - (18 + 9)$

$$= 123 - 27$$

$$= 96$$

3 blocks $= 96$

1 block $= \dfrac{96}{3}$

$= 32$ seashells

Number of seashells Harper collected $= 32 + 9$

$$= 41 \text{ seashells}$$

Answer: 41 seashells

7. Alice and Felix each were given the same amount of allowance. After shopping, Alice had $38 and Felix had $45. Alice spent twice as much as Felix. How much money did they each have at first? [2]

Alice   Felix

1 block = $45 − $38

= $7
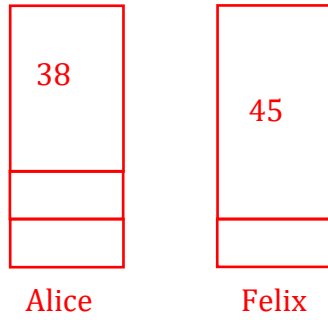
At first, Alice had = $7 + $7 + $38

= $52

At first, Felix had = $7 + $45

= $52

Answer: $52

8. The sum of a puppy, a rabbit and a kitten's ages is 30 months. The rabbit is 6 months older than the puppy, and the kitten is 9 months older than the puppy.

(a) How many months old is the puppy? [2]
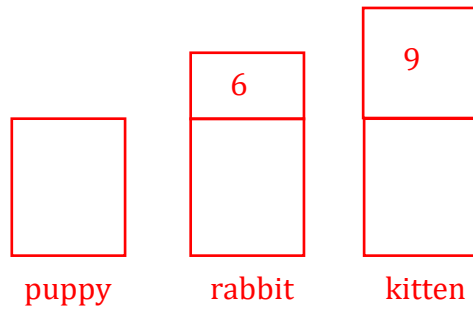
Remove excess $= 30 - (6 + 9)$

$$= 30 - 15$$

$$= 15 \text{ months}$$

3 blocks $= 15$ months

1 block $= \dfrac{15}{3}$

$$= 5 \text{ months}$$

Answer: The puppy is 5 months old.

(b) How many months old is the kitten? [1]

The kitten $= 5 + 9$

$$= 14 \text{ months}$$

Answer: The kitten is 14 months old.

9. Logan has 265 beads, Casey has 285 beads and Quinn has 170 beads. How many beads must Logan and Casey give to Quinn so that the three friends will have the same number of beads? [4]

Total number of beads $= 265 + 285 + 170$

$= 720$ beads

To have the same number of beads, each friend must have $= \frac{720}{3}$

$= 240$ beads

So, Logan must give $265 - 240 = 25$ beads and remain with 240 beads

And Casey must give $285 - 240 = 45$ beads and remain with 240 beads

So, Quinn will then have $170 + 25 + 45 = 240$ beads

Answer: Logan gives 25 beads

Casey gives 45 beads

10. There are 540 persons in a school auditorium Of these, $\frac{1}{6}$ were teachers (men and women) and the others were students (boys and girls).

There are twice as many girls as boys.

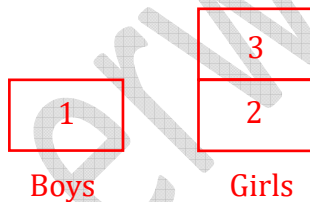The number of women was equal to half the number of boys.

How many men were in the school auditorium?   [4]

Number of teachers $= \frac{1}{6} \times 540$

$= 90$ teachers

Number of students $= 540 - 90$

$= 450$ students

Therefore, 450 are boys and girls, but there are twice as many girls as boys.


```
          ┌───┐
          │ 3 │
    ┌───┐ ├───┤
    │ 1 │ │ 2 │
    └───┘ └───┘
    Boys    Girls
```

3 blocks $= 450$

1 block $= \frac{450}{3}$

$= 150$

Therefore, the number of boys is 150 boys.

Number of women $= \frac{1}{2} \times$ number of boys

$= \frac{1}{2} \times 150$

$= 75$ women

Number of men in school $= 90 - 75$

$= 15$ men

Answer: 15 men

11. Jason drew 52 squares and coloured them either pink, green or blue. There are 26 pink squares and an equal number of green and blue squares.

Calculate the percentage of squares that are green. [3]

Total number of squares $= 52$

Total number of pink squares $= 26$

Therefore, the number of green and blue squares $= 52 - 26$

$$= 26$$

The number of green squares is the same as the number of blue squares.

So, number of green squares $= 26 \div 2$

$$= 13$$

Percentage of green squares $= \frac{Number\ of\ green\ squares}{Total\ number\ of\ squares} \times 100\%$
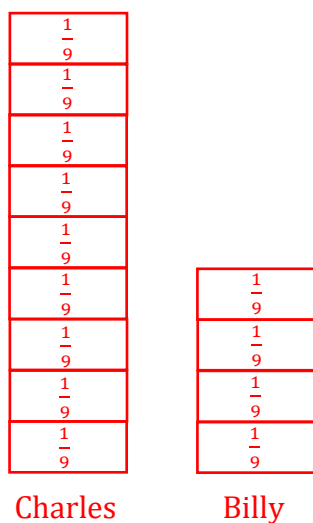
$$= \frac{13}{52} \times 100\%$$

$$= 25\%$$

Answer: 25%

12. Billy scored 44 points in an online game. He scored $\frac{4}{9}$ of the points Charles scored.

How many points did they score altogether?   [3]

We do not know Charles' score but we know $\frac{4}{9}$ of Charles' score, so we represent

Charles' score as a whole, divided into 9 parts.

Charles
$\frac{1}{9}$
$\frac{1}{9}$
$\frac{1}{9}$
$\frac{1}{9}$
$\frac{1}{9}$
$\frac{1}{9}$
$\frac{1}{9}$
$\frac{1}{9}$
$\frac{1}{9}$

Billy
$\frac{1}{9}$
$\frac{1}{9}$
$\frac{1}{9}$
$\frac{1}{9}$

$\frac{4}{9}$ of Charles' score $= 44$

$\frac{1}{9}$ of Charles' score $= 44 \div 4$

$= 11$

$\frac{9}{9}$ of Charles' score $= 11 \times 9$

$= 99$

Number of points they scored altogether $= 99 + 44$
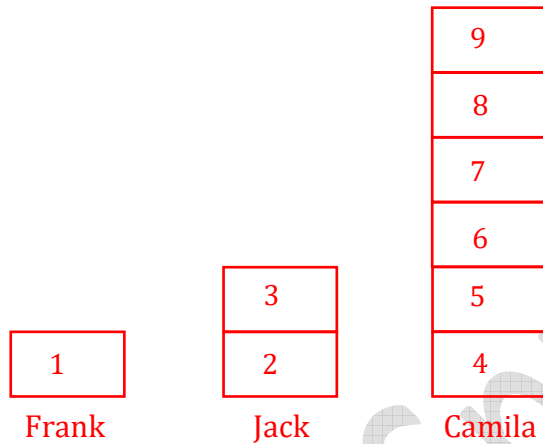
$= 143$ points

Answer: 143 points

13. Mr. Smith shared $675 among his three children: Camila, Jack and Frank.

Camila got 3 times more money than Jack.

Jack got 2 times more money than Frank.

How much more money did Camila get than Frank?   [3]

Frank = 1 share

Jack = 2 shares

Camila = 6 shares (3 times more than Jack, who got 2 times more than Frank)

So, there are 9 shares in total.

9 blocks = $675

$$1 \text{ block} = \frac{\$675}{9}$$

$$= \$75$$

Camila's share = $75 × 6

$$= \$450$$

Therefore,

Amount of money Camila got more than Frank = $450 − $75

$$= \$375$$

Answer: $375

14. Ashley bought some pens and notebooks for school. Each pen costs $3.00 and each notebook costs $9.00. She bought 6 more pens than notebooks and spent a total of $210.00. How many pens did she buy? [3]

<u>Remove the excess:</u>

Excess = $3.00 per pen × 6 pens

$\qquad$ = $18

Therefore, $210 − $18 = $192.

<u>Share the remainder:</u>

Remainder = $192

Therefore,

$192 ÷ ($3 + $9) = $192 ÷ $12

$\qquad\qquad\qquad$ = 16 of EACH

We have 16 of EACH (16 pens and 16 notebooks)

<u>Add back excess:</u>

Number of pens = 16 + 6

$\qquad\qquad$ = 22 pens

Answer: 22 pens

15. Zack and Kelly divided up a bag of marbles between them such that Zack ended up with 36 marbles more than Kelly. If the number of marbles in the bag was 184, how many marbles did Kelly get? [3]

Remove the excess:

$\text{Excess} = 184 - 36$

$\qquad = 148$

Share the remainder:

$\text{Remainder} = 148 \div 2$

$\qquad\quad = 74$

Kelly received $= 74$ marbles

Answer: 74 marbles

16. Three sisters shared 28 dolls among themselves. Ella got 5 more than Sophia who got

4 more than Juliet. How many dolls did Juliet get? [2]

Juliet   Sophia   Ella
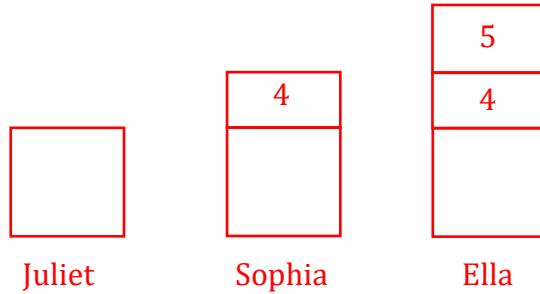
Remove the excess:

$\text{Excess} = 28 - (4 + 4 + 5)$

$= 28 - 13$

$= 15$

Share the remainder:

$\text{Remainder} = 15 \div 3$
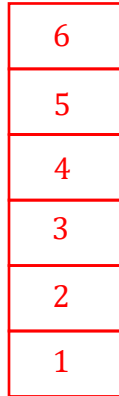
$= 5$

Add back excess:

$\text{Juliet received} = 5 \text{ dolls}$

Answer: 5 dolls

17. The sum of two numbers is 203. The larger number is 6 times the smaller number.

What is the larger number? [2]

6
5
4
3
2
1

7

Larger number   Smaller number

7 blocks = 203

1 block = $\frac{203}{7}$

= 29

Smaller number = 29

Larger number = 29 × 6

= 174

Answer: 174

18. The sum of the ages of Mrs. Jones and her daughter is 68 years. Her daughter is 22 years younger than her. What is Mrs. Jones' age? [2]

22

Mrs. Jones   Daughter

Remove the excess:

$\text{Excess} = 68 - 22$

$= 46$

Share the remainder:

$\text{Remainder} = 46 \div 3$

$= 23$

Add back excess:

$\text{Mrs. Jones' age} = 23 + 22$

$= 45 \text{ years}$

Answer: 45 years

19. Krystal paid $193.75 for 3 smoothies and 5 burgers. Each smoothies costs $3.65 more than each burger. How much did each smoothie cost? [3]

<u>Remove the excess:</u>

Excess = $3.65 × 3

$\qquad$ = $10.95

Therefore, $193.75 − $10.95 = $182.80.

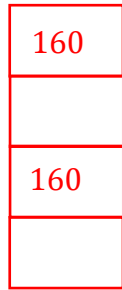<u>Share the remainder:</u>

Remainder = $182.80

Therefore,

$182.80 ÷ 8 = $22.85
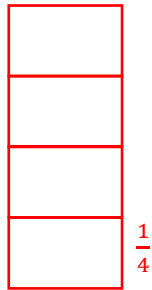
<u>Add back excess:</u>

1 smoothie costs = $22.85 + $3.65

smoothie cost = $26.50

Answer: $26.50

20. There are 800 shirts (large and small) in a store. Half of the small shirts is 160 more than $\frac{1}{4}$ of the large shirts. How many large shirts are there in the store?   [4]

160
160

Small shirts

$\frac{1}{4}$

Large shirts

$160 \times 2 = 320$

$800 - 320 = 480$

6 blocks $= 480$

1 block $= 480 \div 6$

            $= 80$

4 blocks $= 80 \times 4$

blocks $= 320$ large shirts

Answer: 320 large shirts

21. Amelia has 60% of the number of stickers Brittany has, and Jill has $\frac{1}{3}$ of the number of stickers Amelia has. If Brittany has 228 stickers more than Jill, how much stickers does Amelia have? [4]

Brittany   Amelia   Jill
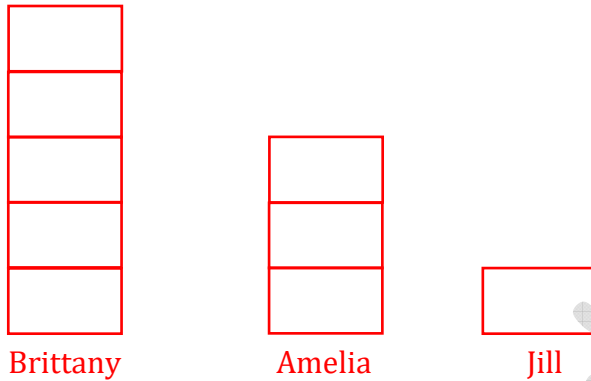
Brittany has 4 more parts than Jill.

4 blocks = 228 stickers

1 block = 228 ÷ 4

= 57 stickers

Amelia has = 57 × 3

= 171 stickers

Answer: 171 stickers

22. According to a recipe for bread, for every 2 cups of sugar, 7 cups of flour was used. If this recipe was used throughout the day, how many cups of each ingredient was used given that there were 306 cups combined overall? [3]

Number of cups of sugar used = 2 cups

$$= 7 \text{ cups}$$

Number of cups used together $= 2 + 7$

$$= 9$$

Overall combined cups = 306 cups

Therefore,

Number of cups of sugar used $= \frac{2}{9} \times 306$

$$= 68 \text{ cups}$$

Number of cups of flour used $= \frac{2}{9} \times 306$

$$= 238 \text{ cups}$$

Answer: 68 cups of sugar

238 cups of flour

23. When sharing cherries among his 3 top students, Mr. Diggle decided to share it according to height. The middle student got twice more than the shortest, and the tallest got three times more than the shortest. How many cherries did each student get if Mr. Diggle shared 540 cherries? [4]

		6
	3	5
1	2	4
Shortest	Middle	Tallest
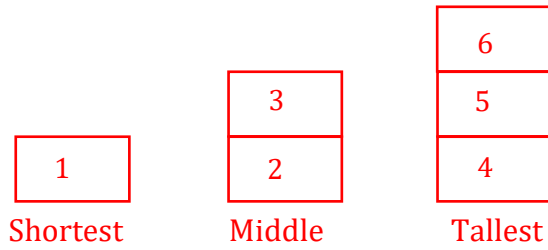
Total shares = 6 shares

Total number of cherries = 540 cherries

Therefore,

Shortest $= \frac{1}{6} \times 540$

$= 90$ cherries

Middle $= \frac{2}{6} \times 540$

$= 180$ cherries

Tallest $= \frac{3}{6} \times 540$

$= 270$ cherries

Answer: Shortest student got 90 cherries

Middle student got 180 cherries

Tallest student got 270 cherries

24. 105 candies are shared equally among 3 friends: Claire, Giselle and Chase.

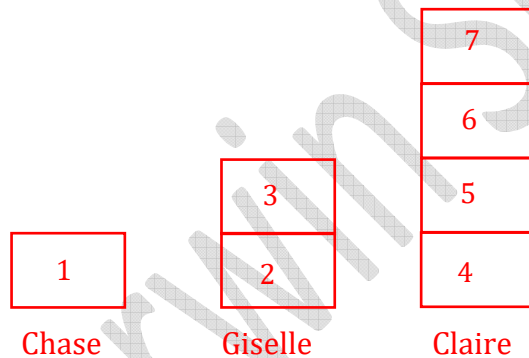(a) How many does each get? [1]

Each friend gets $= 105 \div 3$

$= 35$ candies

Answer: 35 candies

(b) If instead they shared it where Giselle got twice more than Chase and Claire got 4 times more than Chase, how were the candies divided? [3]

		7
		6
	3	5
1	2	4
Chase	Giselle	Claire

Total shares $= 7$ shares

Therefore,

Chase got $= \frac{1}{7} \times 105$

$= 15$ candies

Giselle got $= \frac{2}{7} \times 105$

$= 30$ candies

Claire got $= \frac{4}{7} \times 104$

$= 60$ candies

Answer: Chase got 15 candies

Giselle got 30 candies

Claire got 60 candies

25. In a school, 60% of the school are boys. 15% of the remainder are staff. If there are 340 girls, determine the number of students in the school and the number of staff members. [4]

Boys $= 60\%$

Remainder $= 100\% - 60\%$

$= 40\%$

Staff $= 15\%$ of the remainder

$= 15\%$ of 40%

$= \frac{15}{100} \times \frac{40}{1}$

$= 6\%$

Girls $= 40\% - 6\%$

$= 34\%$

$34\% = 340$ girls

Total people in the school $= \frac{340}{1} \div \frac{34}{100}$

$= \frac{340}{1} \times \frac{100}{34}$

$= 100$

60% boys + 34% girls = 94% of 1000

Number of Students $= \frac{94}{100} \times \frac{1000}{1}$

$= 940$

Number of Staff members $= \frac{6}{100} \times \frac{1000}{1}$

$= 60$

Answer: 940 students

60 staff members