GDST
GIRLS' DAY SCHOOL TRUST

Ratio Scaling

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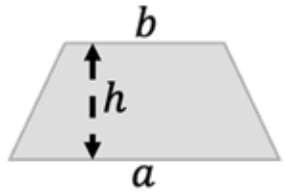
Ratio Scaling – Intro Task

	Simplest Form	Fractions $1:n$	Fractions $n:1$	Decimals $1:n$	Decimals $n:1$	Total $=24$	Total $=1$	Total $=\frac{2}{3}$	Difference $=30$	Difference $=\frac{3}{4}$
e.g.	$3:5$	$1:\frac{5}{3}$	$\frac{3}{5}:1$	$1:1.\dot{6}$	$0.6:1$	$9:15$	$\frac{3}{8}:\frac{5}{8}$	$\frac{1}{4}:\frac{5}{12}$	$45:75$	$\frac{9}{8}:\frac{15}{8}$
a.	$2:3$									
b.	$5:4$									
c.	$9:10$									
d.		$1:\frac{1}{3}$								
e.					$1.2:1$					
f.						$20:4$				
g.							$\frac{5}{13}:\frac{8}{13}$			
h.								$\frac{1}{3}:\frac{1}{3}$		
i.									$60:30$	
j.										$\frac{45}{4}:12$

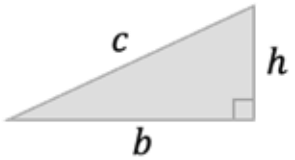
Ratio Sharing – Intro Task

A trapezium has area A, parallel sides a and b, and height h. Find:

1. The area, if $h = 12$ cm and $\boldsymbol{a : b : h = 5 : 4 : 3}$.



2. The height, if $\boldsymbol{A : a : b = 540 : 2 : 3}$ and b is 20 cm longer than a.



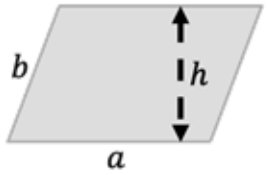
A right-angled triangle has area A, perimeter P, and sides b, c, and h. Find:

3. The area, if the perimeter is 72 cm and $\boldsymbol{b : c : h = 4 : 5 : 3}$.

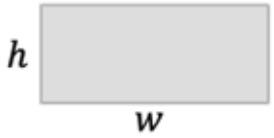
4. The size of the smallest angle, if the angles are in the ratio $\boldsymbol{6 : 19 : 25}$.

A parallelogram has area A, perimeter P, height h, and sides a and b. Find:

5. The ratio $\boldsymbol{a : b : P}$, if the area is 40 m^2, and a is 6 m longer than h and 5 m longer than b.



6. The value of h, if $\boldsymbol{b : P : h = 75 : 1400 : 54}$ and the area is 54 m^2.



For a rectangle with width w cm, height h cm, area A cm^2, and perimeter P cm find:

7. The area, if $P = 84$ and the ratio of w to h is $\boldsymbol{6 : 1}$.

8. The perimeter, if the area is 0.25 cm^2 and the ratio $\boldsymbol{A : w = 1 : 3}$. Leave your answer as a mixed number.

Ratio Sharing – Intro Task

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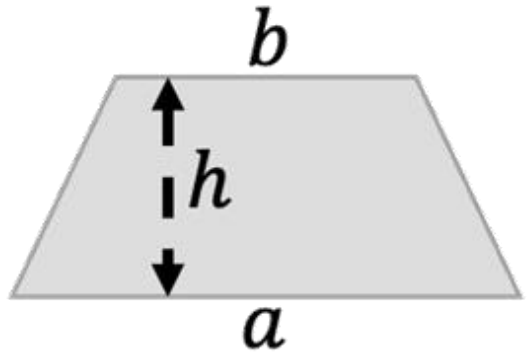

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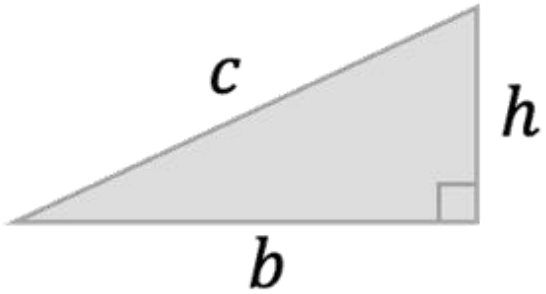

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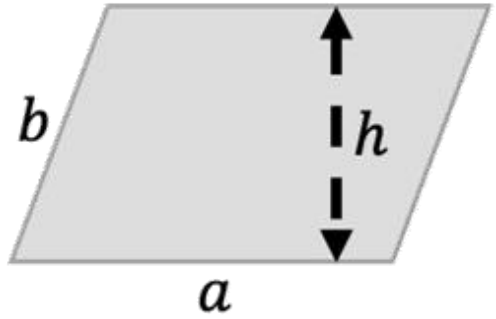

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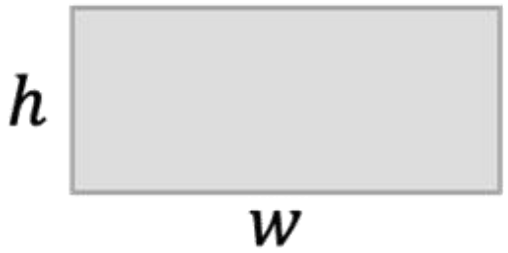

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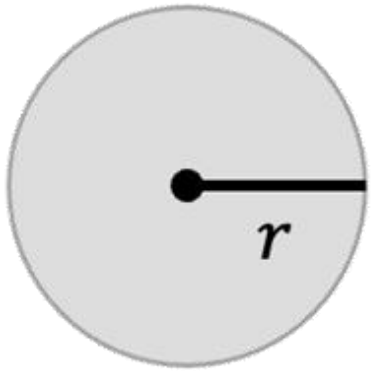
A circle has area A m^2, circumference C m, and radius r m. Find:

9. The radius, if the ratio $\boldsymbol{r : A = 14 : 95}$.



10. The diameter, if the ratio $\boldsymbol{C : A = 1 : 54}$.

"Is there any point to which you would wish to draw my attention?"

"To the curious incident of the dog in the night-time."

"The dog did nothing in the night-time."

"That was the curious incident," remarked Sherlock Holmes.

Karen
@karenshancock

The result of a chat with @nathanday314 a few weeks back where I fought the corner of algebra to solve ratio questions.
He introduced me to a scaling method - I was sceptical, but these things are worth persisting with - and I AM SOLD on this method.

It's a game changer for these type of questions.
25 years of teaching ratio and never even considered this method before this year.

9:37 PM · Mar 5, 2022

Changing Ratios - Invariance

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Question 1

Jo has 1p and 5p coins in the ratio 7 : 3.

Jo gets 26 more 5p coins.

The numbers of 1p and 5p coins are now in the ratio 5 : 4.

How many 5p coins does Jo have now?

Question 2

Jo has 1p and 5p coins in the ratio 7 : 3.

Jo spends 39 of the 1p coins.

The numbers of 1p and 5p coins are now in the ratio 5 : 4.

How many 5p coins does Jo have now?

Question 3

Jo has 1p and 5p coins in the ratio 7 : 3.

Jo swaps 26 of the 1p coins with 5p coins.

The numbers of 1p and 5p coins are now in the ratio 3 : 5.

How many 5p coins does Jo have now?

Question 4

Jo has 1p and 5p coins in the ratio 7 : 3.

Jo is given 18 more 1p coins and 18 more 5p coins.

The numbers of 1p and 5p coins are now in the ratio 4 : 3.

How many 5p coins does Jo have now?

Simple Scaling

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Anne and Bob shared some money in the ratio 3:5

A

If the total shared was £120, what else can you work out?

A	B	$T = A + B$	$D = B - A$
3	5	8	2
		£120	

B

If Anne received £120, what else can you work out?

A	B	$T = A + B$	$D = B - A$
3	5	8	2
£120			

C

If Bob received £120, what else can you work out?

A	B	$T = A + B$	$D = B - A$
3	5	8	2
	£120		

D

If Bob received £120 more than Anne, what else can you work out?

A	B	$T = A + B$	$D = B - A$
3	5	8	2
			£120

Speed, Distance, Time

Alice drove for 5 hours at 63 mph.
Find the distance that Alice travelled during that time.

Distance	Time
63 miles	1 hour
315 miles	5 hours

(×5 between the rows; ×5 between the columns)

Tom drove at a speed of 30 m/s over a distance of 105 metres.
Find the time of Tom's journey.

Distance	Time
30m	1 second
105m	3.5 seconds

(÷30 between the rows)

Alice travels 96 metres in 3 seconds.
Find the average speed of Alice during that time.

Distance	Time
96 metres	3 seconds
32 metres	1 second

(÷3 between the rows; ÷3 between the columns)

32 m/s

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Density, Mass, Volume

A block has a volume of 40 cm^3, and a density of 0.26 g/cm^3. Work out the mass of the block.

Mass	Volume
0.26g	1cm^3
10.4g	40cm^3

×40 ↓ ↓ ×40

A block of wood has a mass of 5 g, and a density of 0.25 g/cm^3. Work out the volume of the block of wood.

Mass	Volume
0.25g	1cm^3
5g	20cm^3

×20 ↓ ↓ ×20

A block of glass has a mass of 54 g, and a volume of 18 cm^3. Work out the density of the block of glass.

Mass	Volume
54g	18cm^3
3g	1cm^3

÷18 ↓ ↓ ÷18

3g/cm^3

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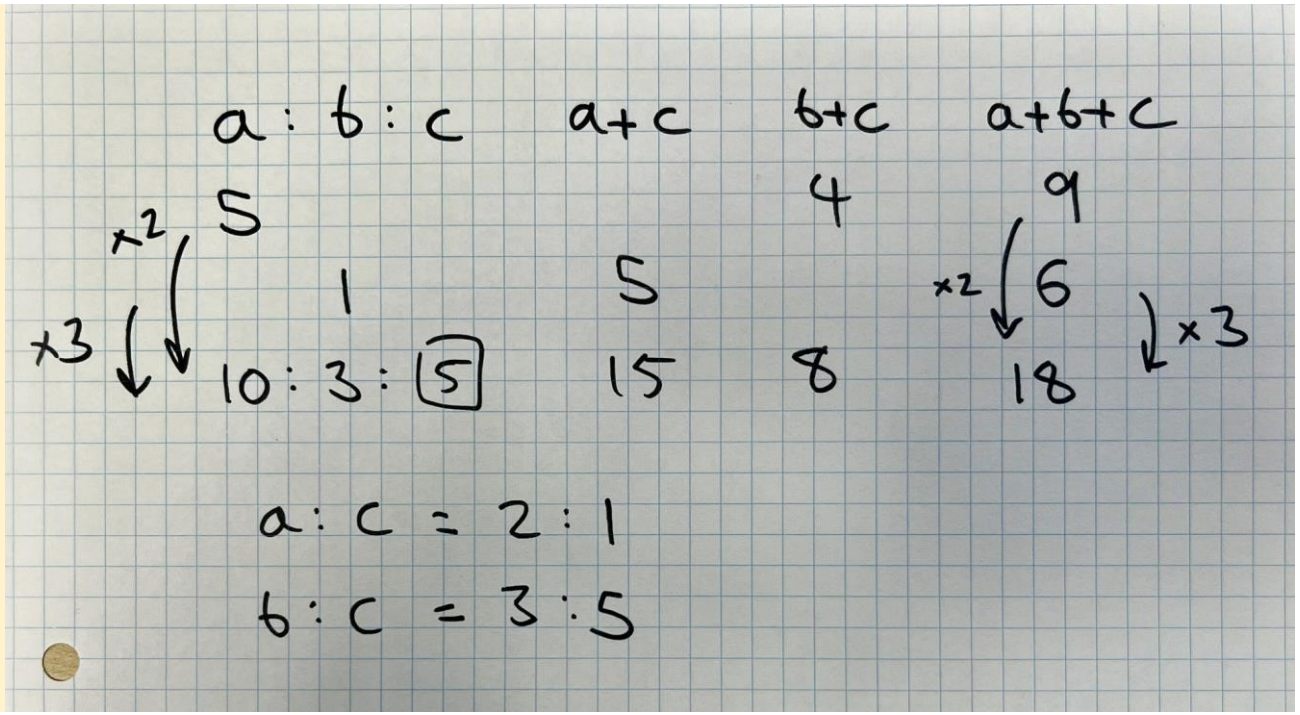
Pressure? Gradient? Probability?

Other Questions

$$a : b + c = 5 : 4$$
$$b : a + c = 1 : 5$$

Write the ratio $a : c$

Write the ratio $b : c$



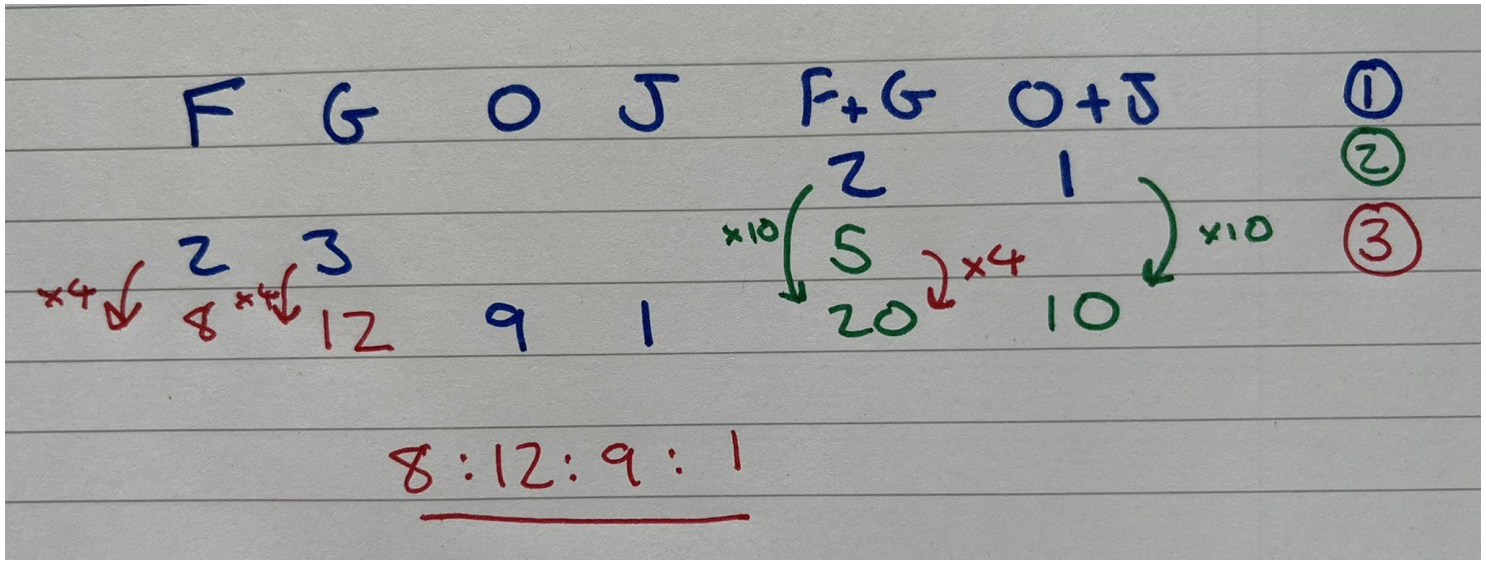
Other Questions

Olivia and Jessica have in total half as many sweets as Fran and Gary have in total.

Fran and Gary share their sweets in the ratio 2 : 3
Olivia and Jessica share their sweets in the ratio 9 : 1

Fran got w sweets.
Gary got x sweets.
Olivia got y sweets.
Jessica got z sweets.

Find, in its simplest form, $w : x : y : z$



Other Questions

There are four boxes on a shelf, **A**, **B**, **C** and **D**.

The total weight of **A** and **B** is 3 times the total weight of **C** and **D**.

The weight of **A** is $\frac{2}{3}$ of the weight of **B**.

The weight of **C** is 75% of the weight of **D**.

Find the ratio

weight of **A** : weight of **B** : weight of **C** : weight of **D**

Other Questions

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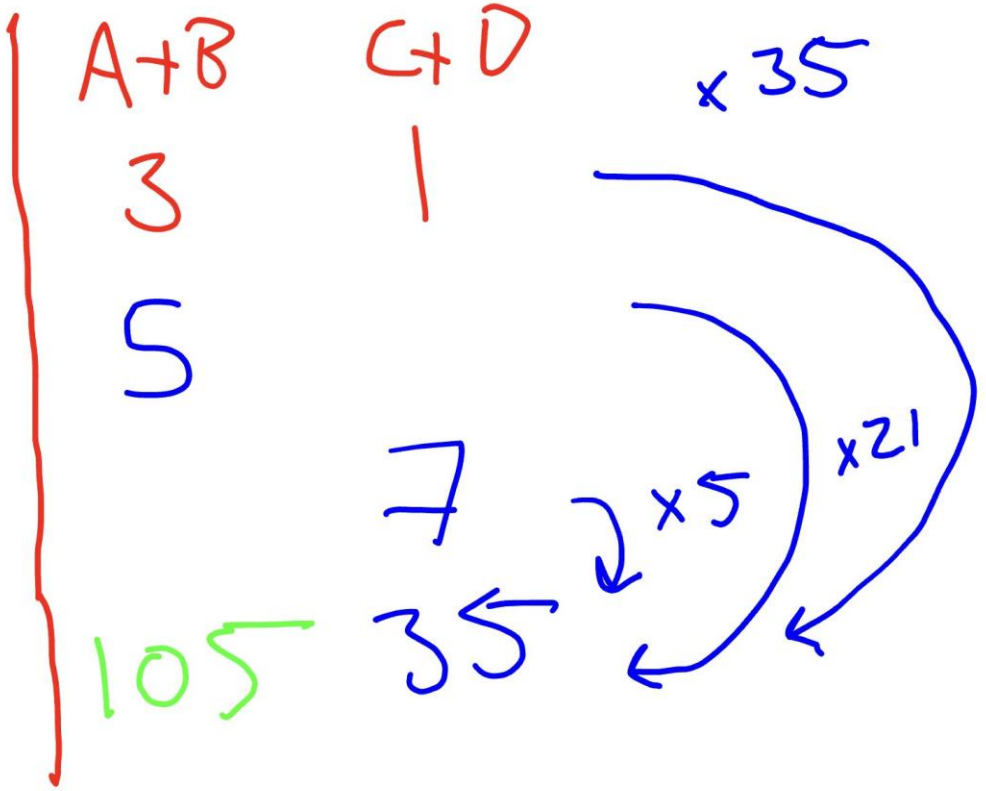
2 3

3 4

42 63 15 20



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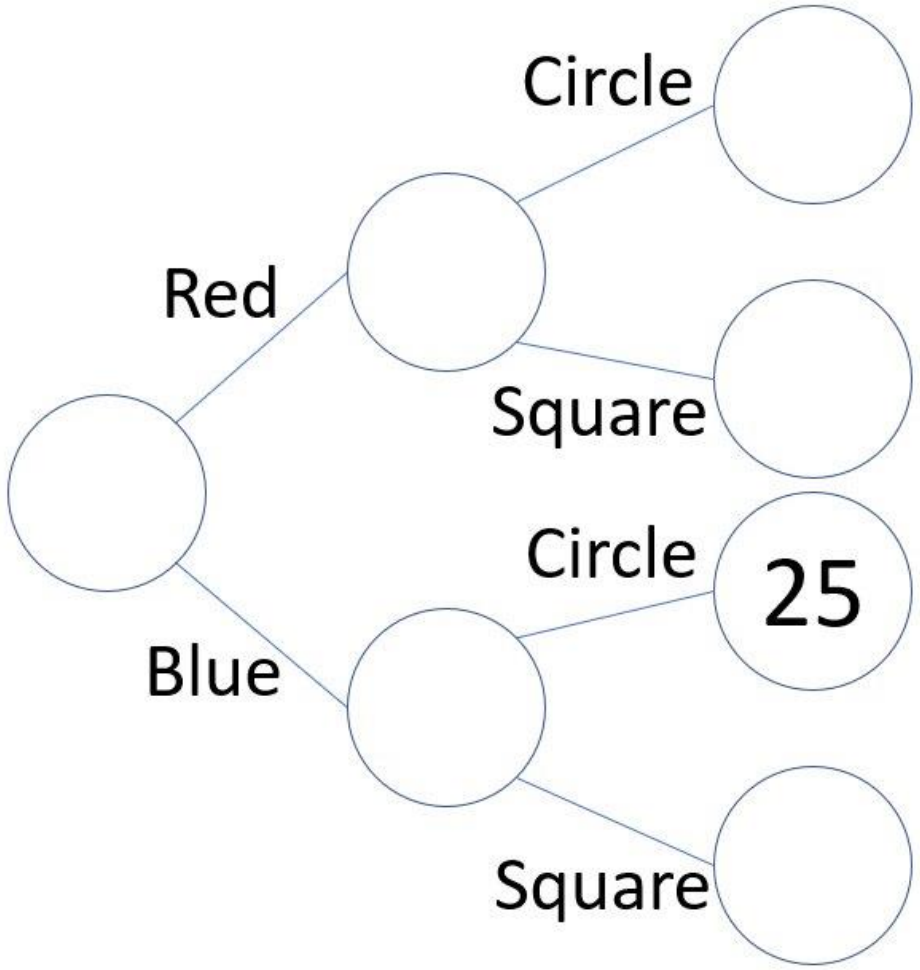


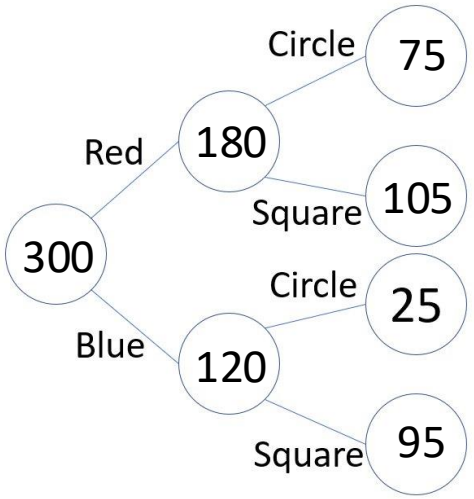
$$Red : Blue = 3 : 2$$

$$Circle : Square = 1 : 2$$

$$P(Red\ Circle) = \frac{1}{4}$$

$$P(Blue\ Square) =$$

Other Questions



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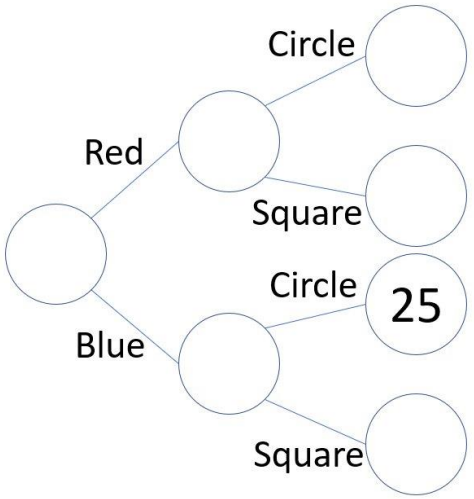
R-C	R-S	B-C	B-S
75	105	25	95
$\frac{1}{4}$			
15	21	5	19

Red	Blue
180	120
3	2
36	24

Circle	Square
100	200
1	2
20	40

Total
300
5
3
1
60

Other Questions



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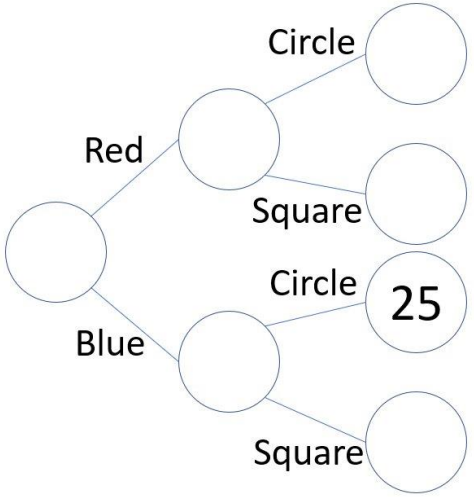

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		25	
$\frac{1}{4}$			

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1	2

Total
1

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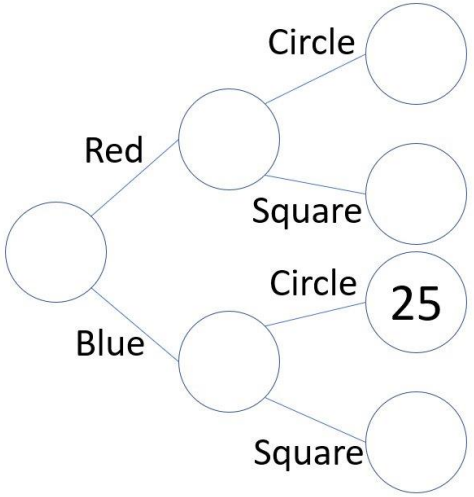

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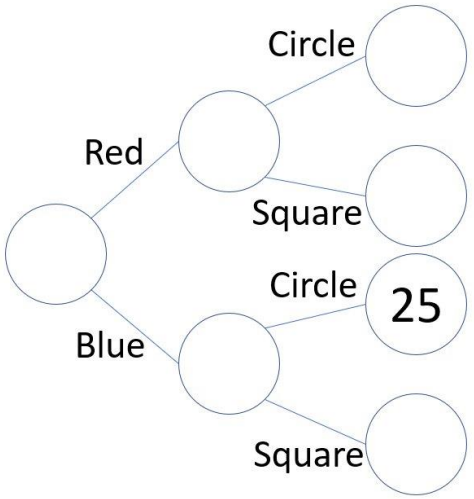

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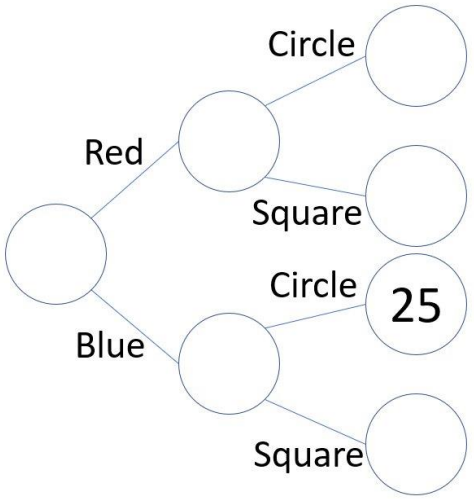

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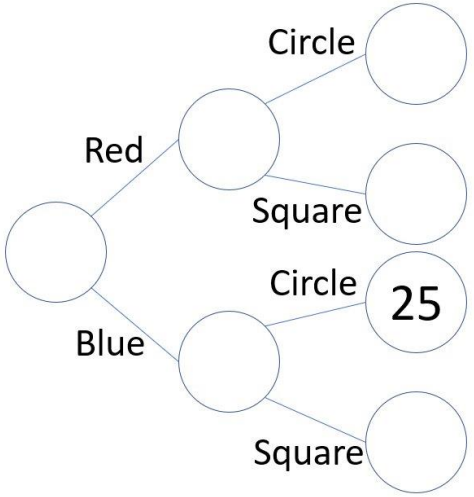

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