SPIRE MATHS

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SS3 Dissecting A Square: 6 Questions

Adapted as part of Standards Unit Resources

All resources for this at: https://spiremaths.co.uk/ss3dissectingasquare/

Standards unit resources at: https://spiremaths.co.uk/ilim/

Answers

Piece	Fraction	Percentage	Reason
A	$\frac{1}{25}$	4	One fifth by one fifth
B	$\frac{3}{25}$	12	Three copies of A
C	$\frac{1}{5}$	20	B with two more of A
D	$\frac{7}{25}$	28	2 more 25ths than C
E	$\frac{9}{25}$	36	Continues pattern above
Total	1	100	

Piece	Fraction	Percentage	Reason
A	$\frac{1}{4}$	25	One quarter of whole
B	$\frac{1}{4}$	25	A and B make half the shape
C	$\frac{1}{10}$	10	Triangle, base 10 height 2 gives area of 10 small squares
D	$\frac{1}{10}$	10	Surround with 8 acroos by 4 down rectangle. Take 3 triangles
E	$\frac{1}{10}$	10	Triangle has same height and base as both C and D
F	$\frac{1}{10}$	10	By symmetry same as D
G	$\frac{1}{10}$	10	By symmetry same as C
Total	1	100	

Piece	Fraction	Percentage	Reason
A	$\frac{1}{20}$	5	Triangle, half by one fifth
B	$\frac{3}{20}$	15	A and B make E
C	$\frac{1}{20}$	5	Same as A by symmetry
D	$\frac{3}{20}$	15	Same as B by symmetry
E	$\frac{1}{5}$	20	There are 5 E here as pairs AB, CF, IH, GD all equal E
F	$\frac{3}{20}$	15	Same as B by symmetry
G	$\frac{1}{20}$	5	Same as A by symmetry
H	$\frac{3}{20}$	15	Same as B by symmetry
I	$\frac{1}{20}$	5	Same as A by symmetry
Total	1	100	

Piece	Fraction	Percentage	Reason
A	$\frac{1}{4}$	25	One quarter of whole
B	$\frac{1}{8}$	12.5	Half of a quarter
C	$\frac{3}{8}$	37.5	Half take away B
D	$\frac{1}{8}$	12.5	Same as B, rotated
E	$\frac{1}{16}$	6.25	One quarter of the corner quarter
F	$\frac{1}{32}$	3.125	Half of E
G	$\frac{1}{32}$	3.125	Same as F
Total	1	100	

Piece	Fraction	Percentage	Reason
A	$\frac{1}{8}$	12.5	A + B make = quarter with same base length and identical height
B	$\frac{1}{8}$	12.5	See A. Base of both A and B is from centre to top right corner.
C	$\frac{1}{16}$	6.25	C + D = one eighth, equal base lengths and identical height
D	$\frac{1}{16}$	6.25	See C. Same area.
E	$\frac{1}{16}$	6.25	E + F = one eighth and are equal in area. Same reason other pairs
F	$\frac{1}{16}$	6.25	Rotation (or reflection) of E
G	$\frac{3}{16}$	18.75	G + H = three eighth of whole (same reasoning as I).
H	$\frac{3}{16}$	18.75	G and H are equal in area, same base length and identical height.
I	$\frac{1}{8}$	12.5	Height is one quarter of square, base is side of square
Total	1	100	

Piece	Fraction	Percentage	Reason
A	——	21.460184	1 - area quarter unit circle
B	——	28.539816	B is half take A
C	——	5.3650459	One quarter of A
D	——	7.1349541	One quarter of B
E	$\frac{1}{8}$	12.5	One half of the corner quarter
F	$\frac{1}{8}$	12.5	Same as E
G	$\frac{1}{8}$	12.5	Same as E
Total	1	100	

Reasons\Working A and B		
Area unit circle	=	3.141593
Area quarter circle	=	0.785398
Area A is 1 - quarter circle	=	0.214602
Area B is half - A	=	0.285398

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