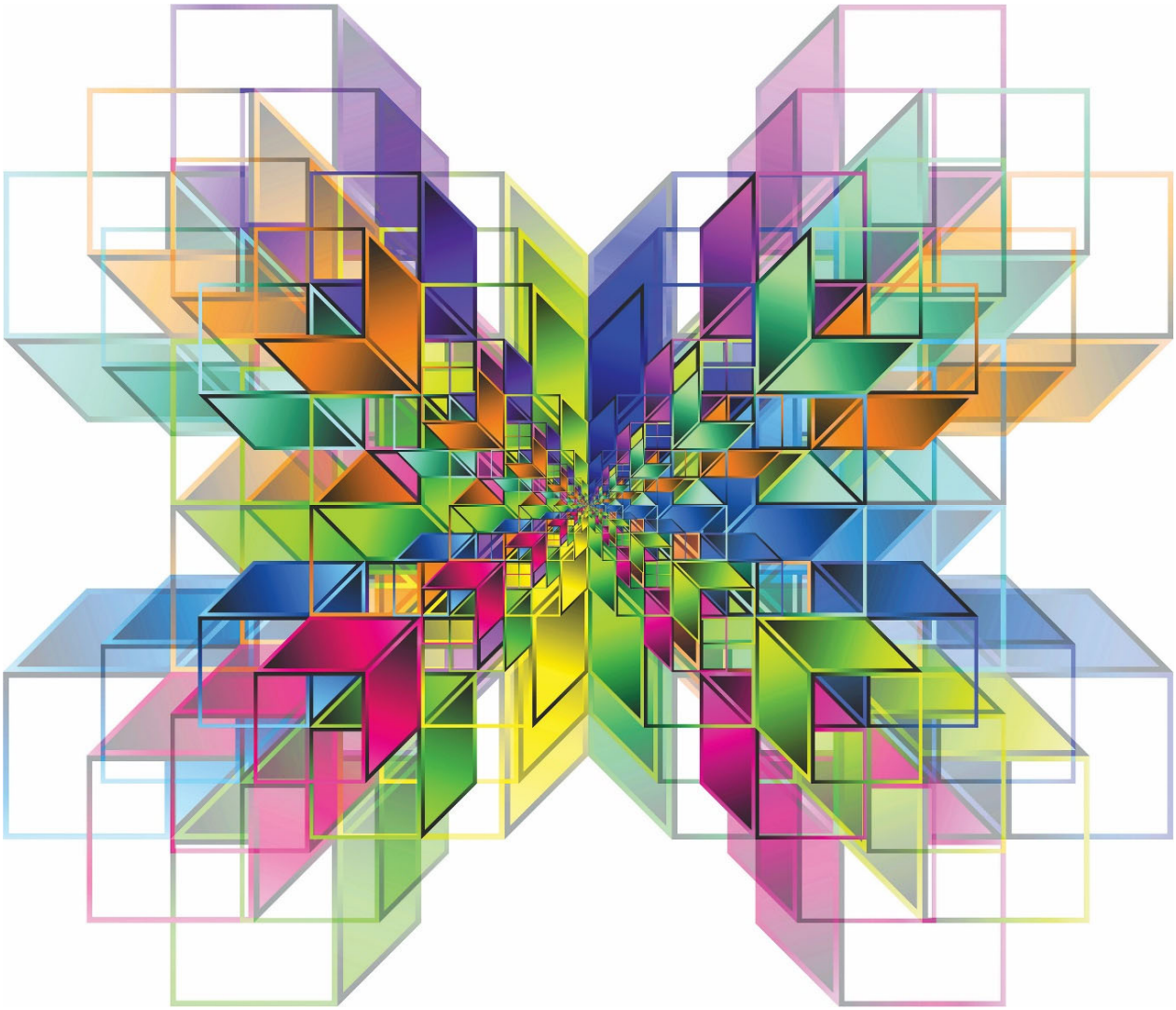
AQA
Realising potential

GCSE
MATHEMATICS

Hub school network meetings

Revision techniques, Same Surface Different Deep (SSDD) booklet

Published: Spring 2020



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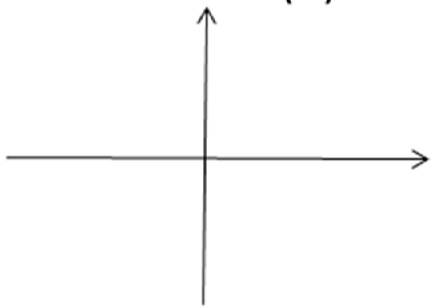
RATIO
A:B = 3:5
If total is £180 How much is A and B?
A = £180, what is B?
B = £180, what is A?
B is £180 more than A. What is the value of A and B?
Write B as a fraction of A
Find the value of n so that n +4 : 2n = 3 : 5
Two cubes A and B with sides in ratio 3:5. If the volume of A is 135cm³, what is the volume of B?
Two cubes A and B with sides in ratio 3:5. If the volume of B is 250cm³, what is the volume of A?
Write as 1:n
Write as n:1
Two squares A and B with sides in ratio 3:5. If the area of B is 225cm², what is the area of A?
Two squares A and B with sides in ratio 3:5. If the area of A is 225cm², what is the area of B?

$f(x) =$	Find $f(x+3)$	Complete the square $f(x)= (x-a)^2 + b$	Complete a table of values for $-4 \leq x \leq 4$
Factorise $f(x)$	Equation of the line of symmetry?	Describe fully the transformations from $Y = x^2$ to $Y = f(x)$	State the coordinates of the minimum point.
Solve $f(x) = 0$ $X =$ $X =$	Find $f(-6)$	Sketch $Y = f(x)$ 	Use the formula to solve $f(x) = 0$

SSDD Pie charts

S19 3F Q17(b)

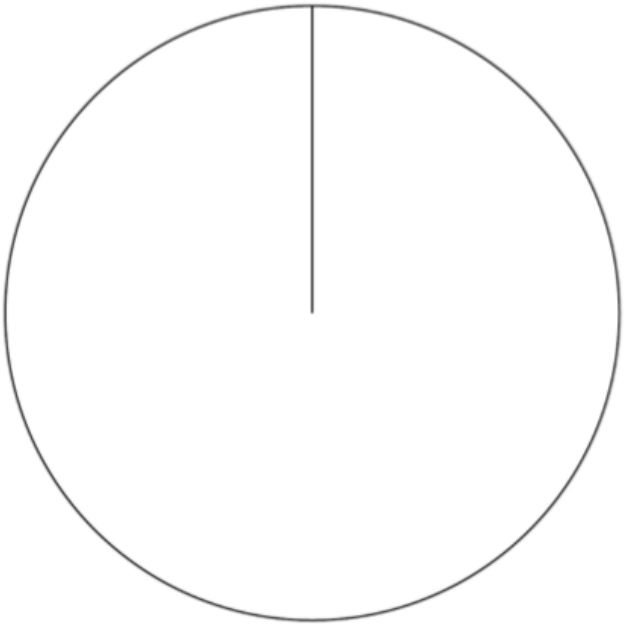
17 (b) In one hour the shop sells 180 scoops of ice cream.

The number of scoops of each flavour is shown in the table.

Flavour	Vanilla	Strawberry	Chocolate	Mint
Number of scoops	45	75	50	10

Complete the pie chart to represent the data.

[4 marks]



N18 3F Q2

2 In a pie chart, one sector represents $\frac{1}{4}$ of the data.

What is the angle of that sector?

Circle your answer.

[1 mark]

4° 25° 45° 90°

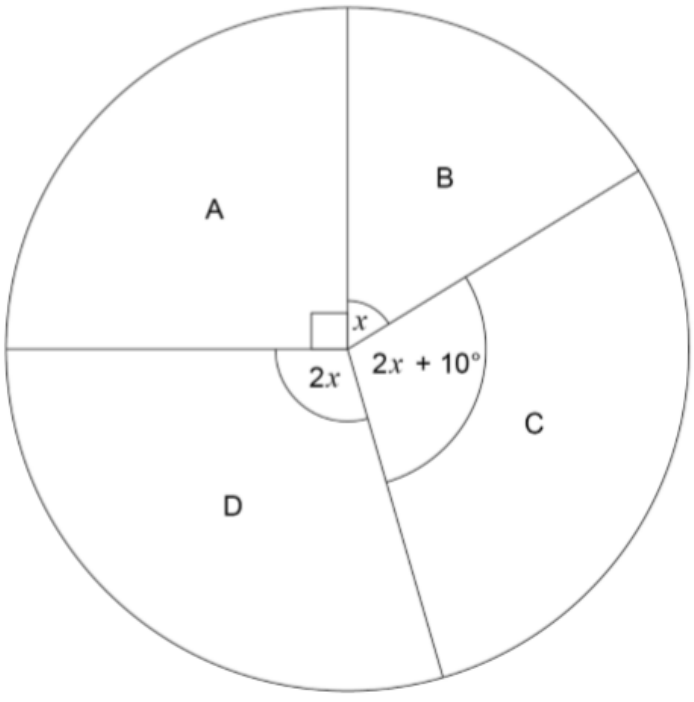
N17 1F Q30

30 The four candidates in an election were A, B, C and D.

The pie chart shows the proportion of votes for each candidate.

Proportion of votes

Not drawn accurately



Work out the probability that a person who voted, chosen at random, voted for C.

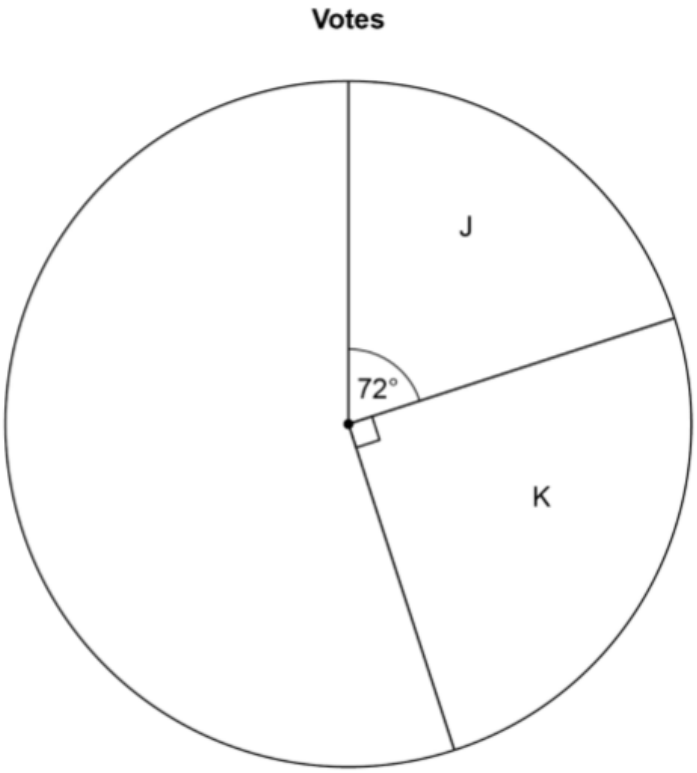
[4 marks]

S18 3F Q19

19 In an election there were four candidates, J, K, L and M.

Fran is drawing a pie chart to show the results.

The sectors for J and K have been drawn.



19 (a) Twice as many people voted for L as voted for M.

Complete the pie chart.

[3 marks]

19 (b) Altogether, 16 200 people voted.

How many voted for J?

[2 marks]

MS Pie charts

S19 3F Q17(b)

17(b)	**Alternative method 1**		
	360 ÷ 180 or 2	M1	implied by a correct angle or implied by a correctly drawn angle in pie chart ± 2°
	Any two of 45 × their 2 or 90° 75 × their 2 or 150° 50 × their 2 or 100° 10 × their 2 or 20°	M1dep	implied by any two correctly drawn angles in pie chart ± 2°
	Pie chart with four sectors drawn, two of which are correctly drawn with angles from 90°, 150°, 100° and 20°	M1dep	± 2° lines must be ruled
	Fully correct pie chart and sectors labelled with flavours	A1	± 2° lines must be ruled

17(b) cont	**Alternative method 2**		
	$45 \div 180 \times 100$ or 25% or $75 \div 180 \times 100$ or $41\frac{2}{3}\%$ or 42% or $50 \div 180 \times 100$ or $27\frac{7}{9}\%$ or 28% or $10 \div 180 \times 100$ or $5\frac{5}{9}\%$ or 6%	M1	oe
	Any two of $45 \div 180 \times 360$ or 90° $75 \div 180 \times 360$ or 150° $50 \div 180 \times 360$ or 100° $10 \div 180 \times 360$ or 20°	M1dep	implied by any two correctly drawn angles in pie chart ± 2°
	Pie chart with four sectors drawn, two of which are correctly drawn with angles from 90°, 150°, 100° and 20°	M1dep	± 2° lines must be ruled
	Fully correct pie chart and sectors labelled with flavours	A1	± 2° lines must be ruled
	Additional Guidance		
	All four sectors must be correctly labelled with letters or words for the accuracy mark		

N18 3F Q2

2	90°	B1	
	Additional Guidance		

N17 1F Q30

30	**Alternative method 1**		
	$x + 2x + 2x + 10$ or $5x + 10$ or $x + 2x + 2x + 10 + 90$ or $5x + 100$	M1	oe
	$x + 2x + 2x + 10 = 360 - 90$ or $5x + 10 = 270$ or $x + 2x + 2x + 10 + 90 = 360$ or $5x + 100 = 360$ or $5x = 260$	M1dep	oe
	$(x =)$ 52 or $2x = 104$ or $2x + 10 = 114$	A1	may be on diagram
	$\frac{114}{360}$ or $\frac{57}{180}$ or $\frac{38}{120}$ or $\frac{19}{60}$ or 0.31(6..) or 0.317 or 0.32 or 31(.6...)% or 31.7% or 32%	B1ft	ft $\frac{2 \times \text{their } 52 + 10}{360}$ or $\frac{\text{their angle for C}}{360}$

30 cont	**Alternative method 2**		
	$\frac{90}{360} + \frac{x}{360} + \frac{2x}{360} + P(C) = 1$ or $\frac{90}{360} + \frac{x}{360} + \frac{2x}{360} + \frac{2x+10}{360}$ or $\frac{2x+10}{5x+100}$	M1	oe
	$\frac{90}{360} + \frac{x}{360} + \frac{2x}{360} + \frac{2x+10}{360} = 1$	M1dep	oe
	$(x =)$ 52 or $2x = 104$ or $2x + 10 = 114$	A1	may be on diagram
	$\frac{114}{360}$ or $\frac{57}{180}$ or $\frac{38}{120}$ or $\frac{19}{60}$ or 0.31(6..) or 0.317 or 0.32 or 31(.6...)% or 31.7% or 32%	B1ft	ft $\frac{2 \times \text{their } 52 + 10}{360}$ or $\frac{\text{their angle for C}}{360}$
	Additional Guidance		
	Ignore incorrect simplification or conversion after $\frac{114}{360}$ oe		M1M1A1B1
	$\frac{360 - 10 - 90}{5}$ oe		M1M1
	$x + 2x + 2x + 10$ followed by $6x + 10 = 270$		M1M0
	Do not accept decimal within fraction for final answer if correct fraction not seen		
	The follow through is not available if A1 awarded		

S18 3F Q19

19(b)	16 200 ÷ 360 or 45 or 360 ÷ 16 200 or 0.022... or 16 200 × $\frac{72}{360}$	M1	oe
	3240	A1	
	Additional Guidance		
	Do not ignore further working		
	16 200 – 3240 = 12 960		M1A0
	$\frac{3240}{16200}$ on answer line		M1A0
	16 200 ÷ 4 ÷ 90		M1
	16 200 ÷ 5		M1
	20% of 16 200 without further correct working		M0

19(a)	360 – 72 – 90 or 198	M1	oe 100(%) – 20(%) – 25(%) or 55(%)
	their 198 ÷ 3 (× 2) or 66 or 132	M1	Correct line drawn implies M1M1 their 55 ÷ 3 (× 2) or 18(.3...) or 36(.6...) or 37
	Correct line drawn within 2° and sections labelled correctly	A1	L in the section with [130°, 134°] M in the section with [64°, 68°]
	Additional Guidance		
	Correct line drawn must be a ruled line for A mark		
	Angles may be on the diagram		
	Mark diagram first, if line out of tolerance, check working for method marks		

SSDD Sequences

S19 2F Q28

28 A linear sequence starts

11 21 31 41 ...

Work out an expression for the nth term of the sequence.

[2 marks]

N18 1F Q14

14 The nth term of a sequence is $5n - 2$

Work out the 3rd term.

Circle your answer.

[1 mark]

51 5 123 13

N18 3F Q14

14 (b) The term-to-term rule of a different sequence is

Subtract 1 and multiply by 5

The third term of this sequence is 120

.... 120

Work out the first term.

[2 marks]

14 (a) The term-to-term rule of a sequence is

Add 8 and divide by 2

The first term of the sequence is –24

Work out the next two terms.

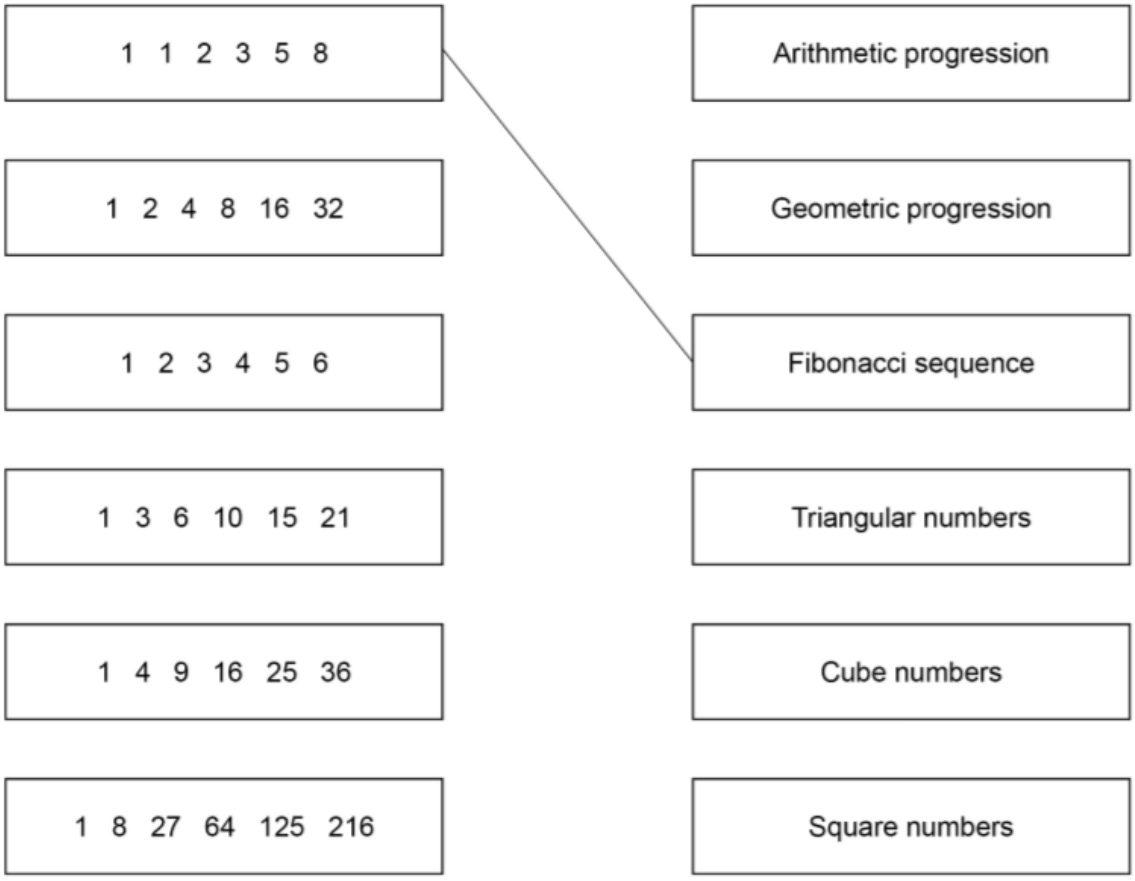
[2 marks]

S18 2F Q23

23 Match each sequence to its description.

One has been done for you.

[4 marks]



MS Sequences

S19 2F Q28

28	$10n + 1$ or $1 + 10n$	B2	B1 $10n$ (...)
	Additional Guidance		
	Ignore LHS of formula given eg $Tn = 10n + 1$		B2
	Condone $n = 10n + 1$ or nth term $= 10n + 1$		B2
	Allow other variables eg $10x + 1$		B2
	Allow a multiplication sign eg $10 \times n + 1$ or $n \times 10 + 1$		B2
	$n10$ ...		B1
	$n10 + 1$		B1
	$10n + 1n$		B0
	Choice eg $10n + 1$ and $1n + 10$		B0

N18 1F Q14

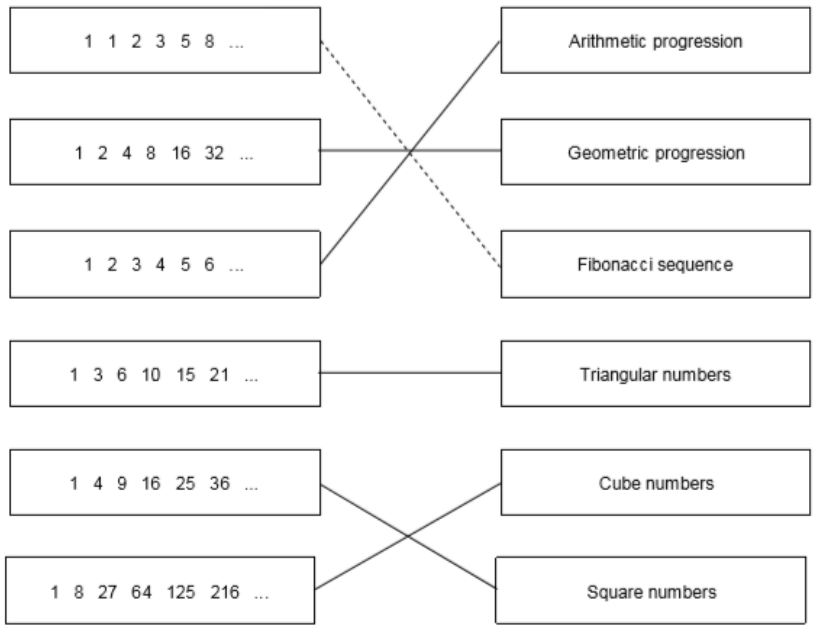
14	13	B1	

N18 3F Q14

14(a)	–8	B1	
	0	B1ft	ft their –8
	Additional Guidance		
	Mark answer line first If either part of answer line is blank look for terms in working		
	–20 and –6		B0B1ft
	–20 and –16		B0B0ft

14(b)	÷ 5 then + 1	M1	implied by 2nd term 25 or correct first term for their 25
	6	A1	
	Additional Guidance		
	6, 25 with no working seen or on dotted lines		M1A1
	2nd term 23 and 1st term 5.6 is the correct first term for their 25		M1A0
	25 with no incorrect working		M1

S18 2F Q23

23	All 5 correct	B4	B3 for 4 correct B2 for 3 correct B1 for 1 or 2 correct
	Additional Guidance		
			B4
	Two connections from a LH box is choice so is incorrect for that box		
	Connections do not have to be straight lines		

SSDD Triangles

S19 3F Q29

29 Two sides of a triangle have lengths 13 cm and 27 cm

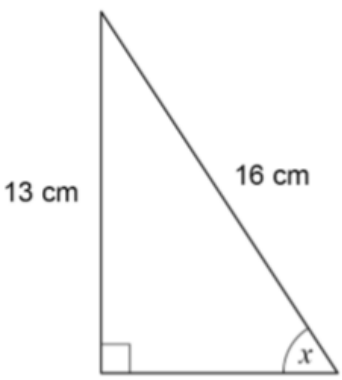
Which of these is a **possible** length of the other side?
Circle your answer.

[1 mark]

13 cm 14 cm 27 cm 40 cm

S19 3F Q30

30 Here is a right-angled triangle.



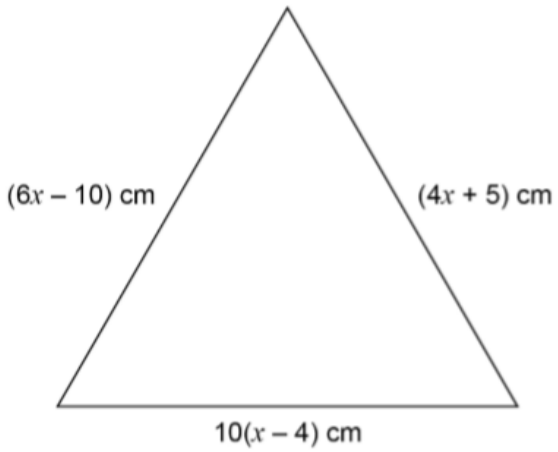
Not drawn accurately

Use trigonometry to work out the size of angle x.

[2 marks]

N18 2F Q25

25 This triangle is equilateral.



Not drawn accurately

Is the perimeter of the triangle greater than one metre?

You **must** show your working.

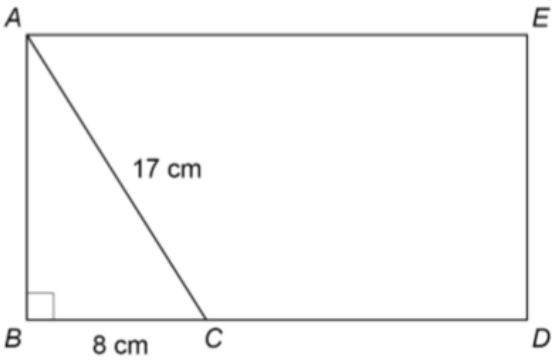
[5 marks]

S19 2F Q22

22 The diagram shows rectangle *ABDE* and right-angled triangle *ABC*.

AC = 17 cm

BC = 8 cm



Not drawn accurately

BC : *CD* = 1 : 2

Work out the area of rectangle *ABDE*.

[4 marks]

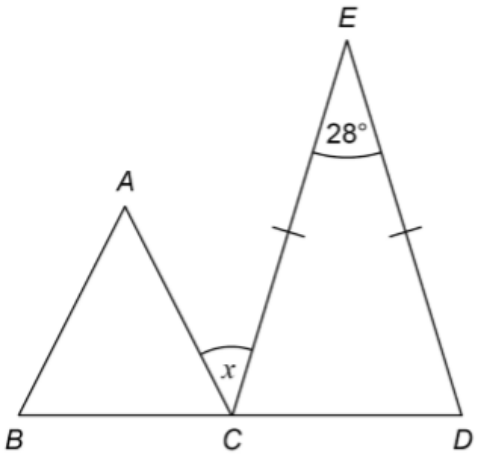
S18 2F Q16(a)

16 (a) *BCD* is a straight line.

Triangle *ABC* is equilateral.

CE = *DE*

Not drawn accurately



Work out the size of angle x.

[4 marks]

MS Triangles

S19 3F Q29

29	27 cm	B1	

S19 3F Q30

30	**Alternative method 1**		
	$\sin x = \frac{13}{16}$ or $\sin^{-1}\frac{13}{16}$	M1	oe $\sin x = 0.8125$
	54(.3...)	A1	
	Alternative method 2		
	$\cos x = \frac{13}{16}$ or $\cos^{-1}\frac{13}{16}$ and 90 – their [35.6, 36]	M1	oe
	54(.3...)	A1	
	Alternative method 3		
	$\cos x = \frac{\sqrt{16^2 - 13^2}}{16}$ or $\tan x = \frac{13}{\sqrt{16^2 - 13^2}}$	M1	oe
	54(.3...)	A1	
	Additional Guidance		
	$\sin = \frac{13}{16}$ or $\sin \frac{13}{16}$ or $\sin^{-1} = \frac{13}{16}$ unless recovered		M0
	Answer 54 from scale drawing with no trigonometry		M0A0

N18 2F Q25

25	$4x + 5 = 6x - 10$ or $4x + 5 = 10(x - 4)$ or $6x - 10 = 10(x - 4)$	M1	oe eg $4x + 5 + 6x - 10 = 2 \times 10(x - 4)$ condone $10x - 4$ for $10(x - 4)$
	$4x - 6x = -10 - 5$ or $-2x = -15$ or $4x - 10x = -40 - 5$ or $-6x = -45$ or $6x - 10x = -40 + 10$ or $-4x = -30$	M1dep	oe collection of terms eg $4x + 6x - 20x = -80 - 5 + 10$ or $-10x = -75$ condone $10x - 4$ for $10(x - 4)$ eg $4x - 10x = -4 - 5$ or $6x - 10x = -4 + 10$
	$(x =)$ 7.5	A1	oe may be implied by (side length =) 35 or (perimeter =) 105
	(6 × their 7.5 – 10) × 3 or (4 × their 7.5 + 5) × 3 or 10 × (their 7.5 – 4) × 3 or 35 × 3 or 6 × their 7.5 – 10 + 4 × their 7.5 + 5 + 10 × (their 7.5 – 4) or 20 × their 7.5 – 45 or 105	M1dep	oe dep on M1M1 condone $10x - 4$ for $10(x - 4)$ must show working if M1M1A0
	105 and Yes	A1	oe eg 1.05 and Yes
	Additional Guidance		
	$4x + 5 = 6x - 10 = 10(x - 4)$		M1
	Condone $10x - 4$ for $10(x - 4)$ for up to M3		

S19 2F Q22

22	**Alternative method 1**		
	8^2 or 64 and 17^2 or 289	M1	
	$\sqrt{17^2 - 8^2}$ or $\sqrt{225}$ or 15	M1dep	oe implies M2 may be seen on diagram
	8 × 3 × their 15 or 24 × their 15	M1dep	dep on M2 oe eg (8 + 16) × their 15 or 0.5 × 8 × their 15 × 6
	360	A1	SC2 [448.8, 456]
	Alternative method 2		
	$\cos C = \frac{8}{17}$ or C = [61.9, 62]	M1	may be seen on diagram
	17 × sin their [61.9, 62] or [14.9, 15.1]	M1dep	may be seen on diagram oe eg 8 × tan their [61.9, 62]
	8 × 3 × their [14.9, 15.1] or 24 × their [14.9, 15.1] or [357.6, 362.4]	M1dep	dep on M2 oe eg (8 + 16) × their [14.9, 15.1] or 0.5 × 8 × their [14.9, 15.1] × 6
	360	A1	SC2 [448.8, 456]
	Alternative method 3		
	$\sin A = \frac{8}{17}$ or A = [28, 28.1]	M1	may be seen on diagram
	17 × cos their [28, 28.1] or [14.9, 15.1]	M1dep	may be seen on diagram oe eg 8 ÷ tan their [28, 28.1]
	8 × 3 × their [14.9, 15.1] or 24 × their [14.9, 15.1] or [357.6, 362.4]	M1dep	dep on M2 oe eg (8 + 16) × their [14.9, 15.1] or 0.5 × 8 × their [14.9, 15.1] × 6
	360	A1	SC2 [448.8, 456]

22 cont	**Alternative method 4**		
	$\cos C = \frac{8}{17}$ or $C = [61.9, 62]$	M1	may be seen on diagram
	$\frac{1}{2} \times 8 \times 17 \times \sin$ their [61.9, 62] or [59.9, 60.1]	M1dep	oe
	6 × their [59.9, 60.1] or [357.6, 362.4]	M1dep	oe
	360	A1	SC2 [448.8, 456]
	Additional Guidance		
	15 without a contradictory value for *AB* scores the first two marks on Alt method 1, even if not subsequently used		M1M1
	$\sqrt{17^2 + 8^2}$		M1M0
	3rd M1 is for the total area and may be calculated in various ways eg using a trapezium + a triangle		
	3rd M1 is for the total area so further work will lose the mark eg 360 seen followed by 360 – 60, answer 300		M1M1M0A0
	May use sine rule or cosine rule but must reach *AB* = ... to award the second M1 in Alt 2 or 3		

S18 2F Q16(a)

16(a)	180 ÷ 3 or 60	M1	oe eg 60 + 60 + 60 = 180
	(180 – 28) ÷ 2 or 152 ÷ 2 or 76	M1	oe eg 76 + 76 + 28 = 180
	180 – their 60 – their 76	M1dep	oe eg 44 + 60 + 76 = 180 dep on M1M1
	44	A1	
	Additional Guidance		
	60 or 76 seen in appropriate place on diagram or in working scores one mark for each		
	Answer 44 not from wrong working		M3A1
	180 – 28 ÷ 2 unless recovered		2nd M0

Contact us

Our friendly team will be happy to support you between 8am and 5pm, Monday to Friday.

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