




JustMaths

Countdown to your final Maths exc
Part 6 (2019)

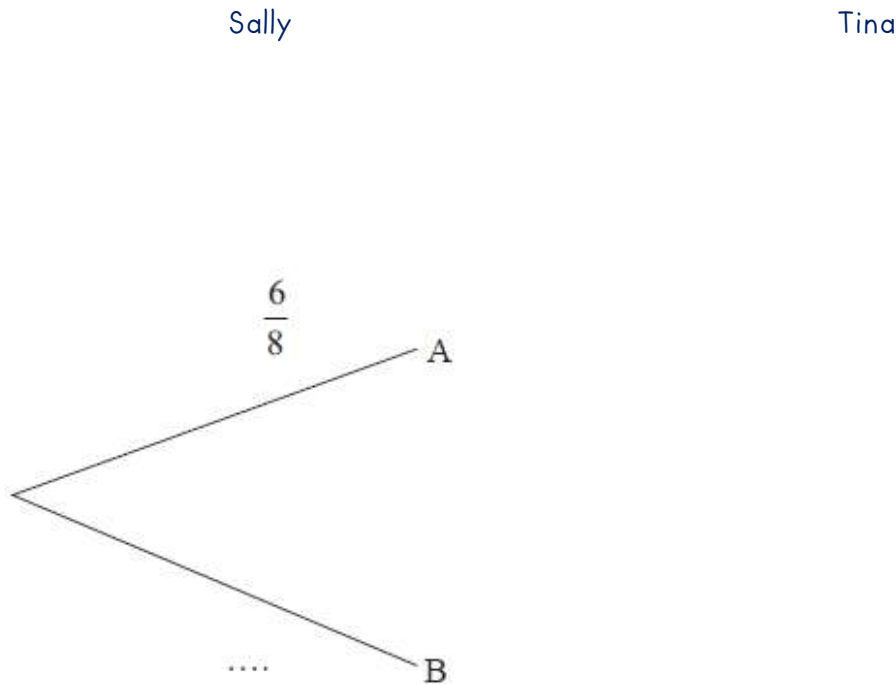


“WORKING ABOVE”

	Marks	Actual	  
Q1. Probability trees	8		
Q2. Similarity	4		
Q3. Conditional probability	4		
Q4. Conditional probability	4		
Q5. Similarity and volume	2		
Q6. Similarity – area and volume	5		
Q7. Similarity / Algebraic	4		
Q8. Probability	4		
Q9. Similarity	2		
Q10. Probability	4		
Q11. Proof	3		
Q12. Probability	3		
Q13. Similarity proof	5		
Q14. Probability	5		

Q1. There are 8 counters in a box. The letter A is on 6 of the counters. The letter B is on the other 2 counters. Sally takes at random a counter from the box. She keeps the counter. Then Tina takes at random a counter from the box.

(a) Complete the probability tree diagram.



(3)

(b) Work out the probability that both Sally and Tina take a counter with the letter A on it.

(2)

(c) Work out the probability that at least one counter with the letter A on it is taken.

(3)

Q2. ABC is a triangle.

D is a point on AB and E is a point on AC .

DE is parallel to BC .

$AD = 4$ cm, $DB = 6$ cm, $DE = 5$ cm, $AE = 5.8$ cm.

Calculate the perimeter of the trapezium $DBCE$.

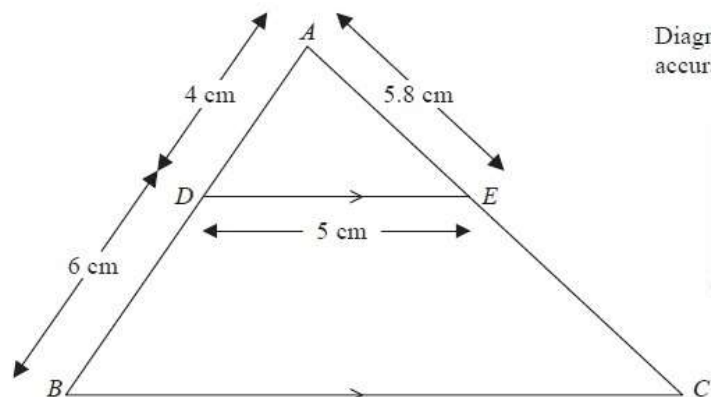


Diagram NOT accurately drawn



(4)

Q3. Nomusa has 30 sweets.

She has

18 fruit sweets

7 aniseed sweets

5 mint sweets

Nomusa is going to take at random two sweets.

Work out the probability that the two sweets will not be the same type of sweet.

You must show all your working.



(4)

Q4. There are 11 girls and 8 boys in a tennis club.

Jake is going to pick at random a team from the tennis club.

The team will have two players.

Work out the probability that Jake will pick two boys or two girls for the team.

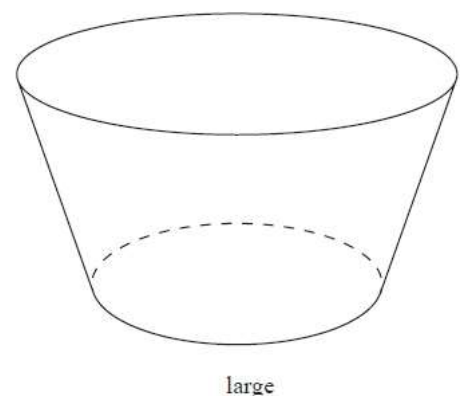
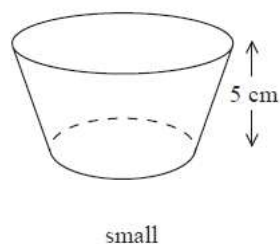
Q5. A factory makes ice cream tubs in two sizes, small and large.

The tubs are similar in shape.

The height of the small tub is 5 cm

The volume of the small tub is 150 cm^3

The volume of the large tub is 500 cm^3



(4)

Work out the height of the large tub. Give your answer correct to 3 significant figures.

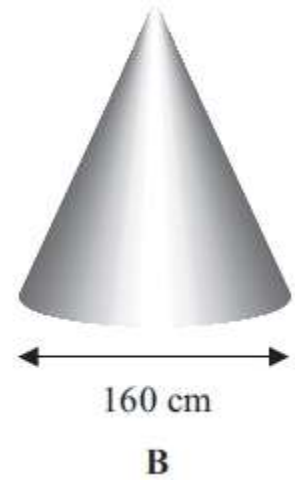


(2)

Q6. Ali has two solid cones made from the same type of metal.

The two solid cones are mathematically similar.

The base of cone A is a circle with diameter 80 cm.



The base of cone B is a circle with diameter 160 cm.

Ali uses 80 m of paint to paint cone A.
Ali is going to paint cone B.



(a) Work out how much paint, in m, he will need.

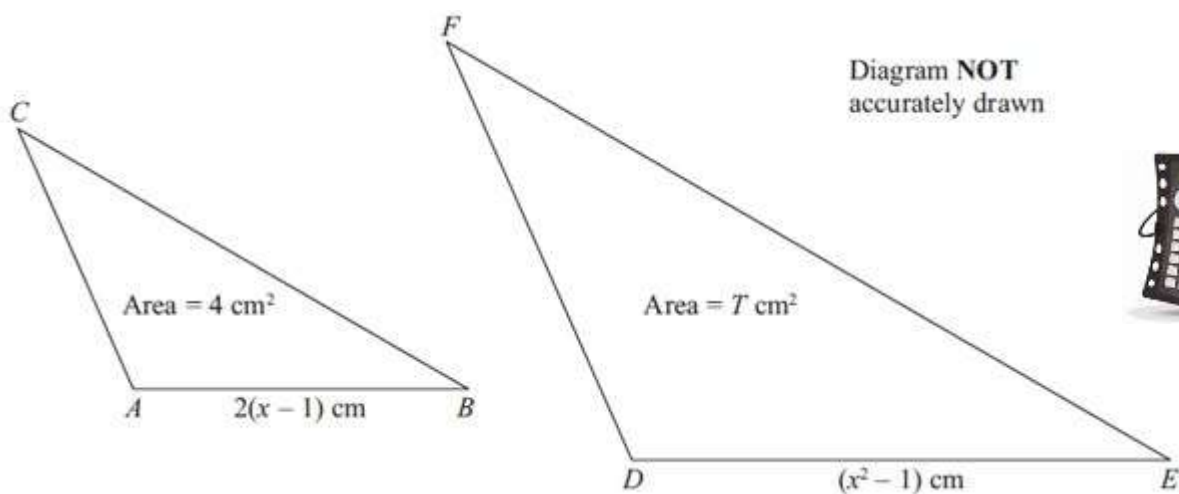
(2)

The volume of cone A is $171\,700\text{ cm}^3$.

(b) Work out the volume of cone B.

(3)

Q7.



Triangles ABC and DEF are mathematically similar.

The base, AB , of triangle ABC has length $2(x-1)\text{ cm}$

The base, DE , of triangle DEF has length $(x^2-1)\text{ cm}$

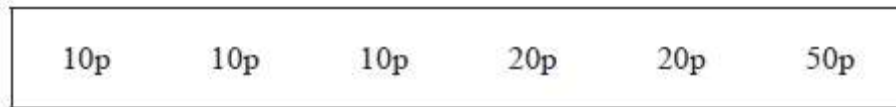
The area of triangle ABC is 4 cm^2

The area of triangle DEF is $T \text{ cm}^2$

Prove that $T = x^2 + 2x + 1$

(4)

Q8. These 6 coins are in a box.

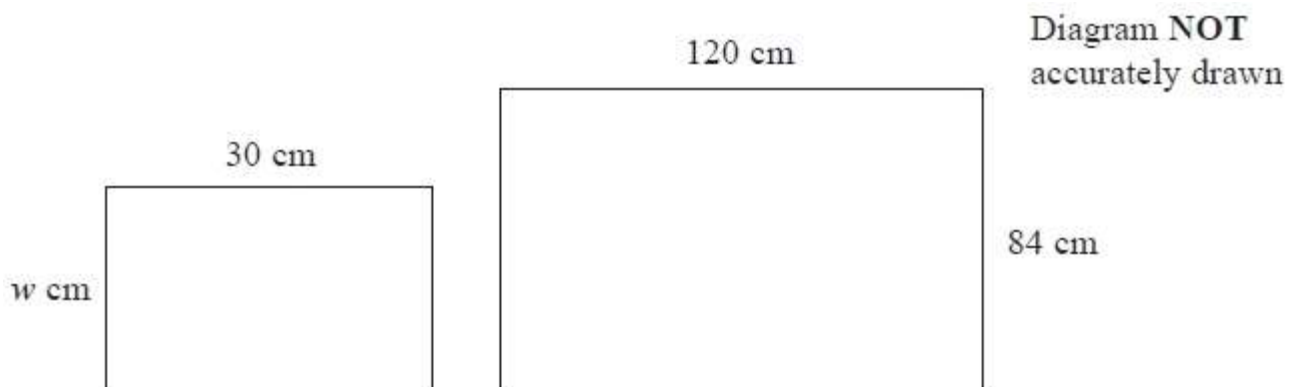


Pritesh takes at random 2 coins from the box.

Work out the probability that the total value of the 2 coins is at least 40p.

(4)

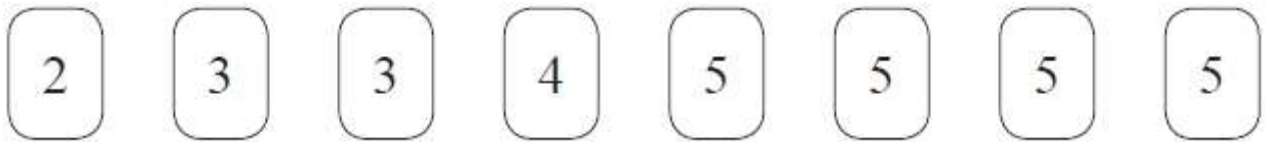
Q9. The diagram shows two rectangles.



The rectangles are similar. Work out the value of w .

(2)

Q10. Paul has 8 cards. There is a number on each card.



Paul takes at random 3 of the cards.

He adds together the 3 numbers on the cards to get a total T .

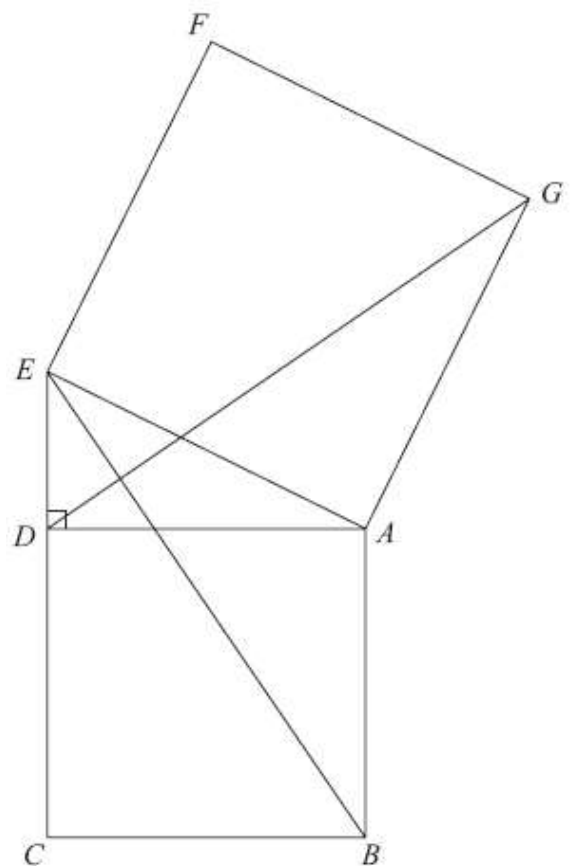
Work out the probability that T is an odd number.

Q11. In the diagram,

ADE is a right-angled triangle,

$ABCD$ and $AEFG$ are squares.

Prove that triangle ABE is congruent to triangle ADG .



(4)

(3)

Q12. Here are 8 cards. There is a number on each card.

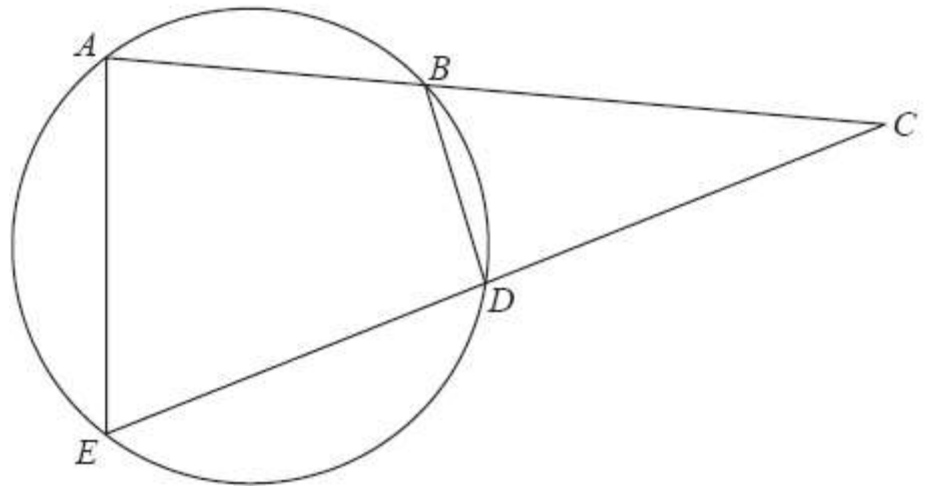


Erin puts the 8 cards in a bag. She takes at random a card from the bag and does not replace it. Erin then takes at random a second card from the bag.

Calculate the probability that the number on the second card is double the number on the first card.

(3)

Q13. A , B , D and E are points on a circle. ABC and EDC are straight lines.



Prove that triangle BCD is similar to triangle ECA . You must give reasons for your working.

(5)

Q14. There are 10 pens in a box. There are x red pens in the box. All the other pens are blue.

Jack takes at random two pens from the box.

Find an expression, in terms of x , for the probability that Jack takes one pen of each colour.

Give your answer in its simplest form.

(5)