

MR TOMPKINS EDTECH

Maths and Edtech videos for students and teachers...

Top 10 Topics for Paper 2

Complete the questions first, and then use the video to mark/uplevel your work in red pen. Video link: https://youtu.be/53LsPn7MJrM

Suitable for Foundation Tier Students

- Factors and Multiples
- Perimeter
- Frequency Trees
- Algebraic Expressions
- Pythagoras' Theorem
- Angles
- Linear Graphs
- Quadratic Graphs
- Trigonometry
- Quadratic Expressions and Equations
- Tree Diagrams

Factors and Multiples

Q1. Write down **all** the factors of 12

_____

_____

_____

_____

Answer _____

(Total 2 marks)

Q2. (a) Write down **all** the factors of 18

Answer _____ **(2)**

(b) Work out the lowest common multiple (LCM) of 12 and 15

_____

_____

_____

Answer _____ **(2)**

(Total 4 marks)

Q3. Work out the highest common factor (HCF) of 12 and 18

_____

_____

_____

_____

Answer _____

(Total 2 marks)

Q4. (a) Work out the highest common factor (HCF) of 12 and 20

_____

_____

Answer _____

(2)

(b) Work out the lowest common multiple (LCM) of 6 and 8

_____

_____

_____

_____

Answer _____ **(2)**

(Total 4 marks)

Q5. Complete the boxes using

a factor of 12

and

a factor of 40



(Total 2 marks)

Q6. Write 300 as a product of its prime factors.

Answer _____

(Total 2 marks)

Q7. Write 140 as a product of prime numbers in index form.

_____

_____

_____

_____

_____

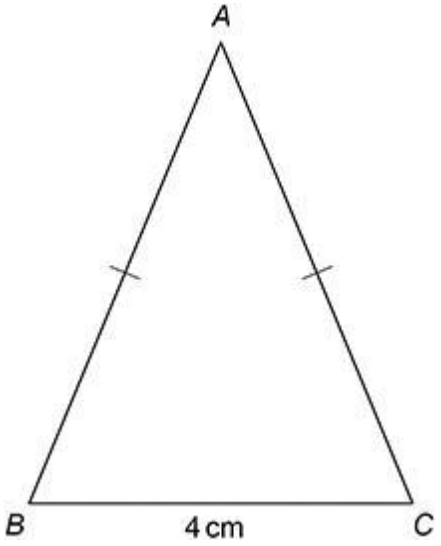
Answer _____

(Total 3 marks)

Perimeter

Q8. In this isosceles triangle,

$AB = AC$



Not drawn accurately

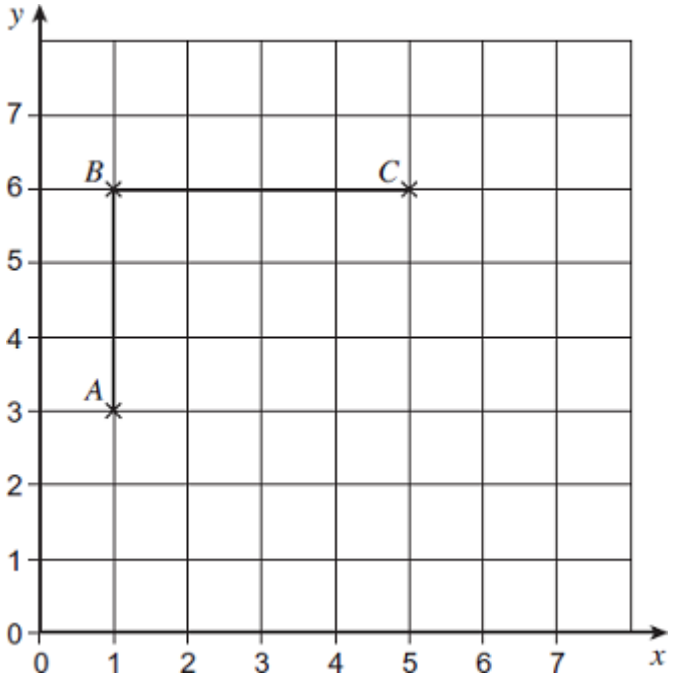
The perimeter of the triangle is 22 cm

Work out the length of AB.

Answer _____ cm

(Total 3 marks)

Q10. Lines AB and BC are shown on the centimetre grid.



(a) Write down the coordinates of point A.

Answer (_____ , _____)

(1)

(b) A, B and C are three corners of a rectangle $ABCD$.

Complete the rectangle on the grid.

(1)

(c) Work out the perimeter of rectangle $ABCD$.

_____

_____

_____

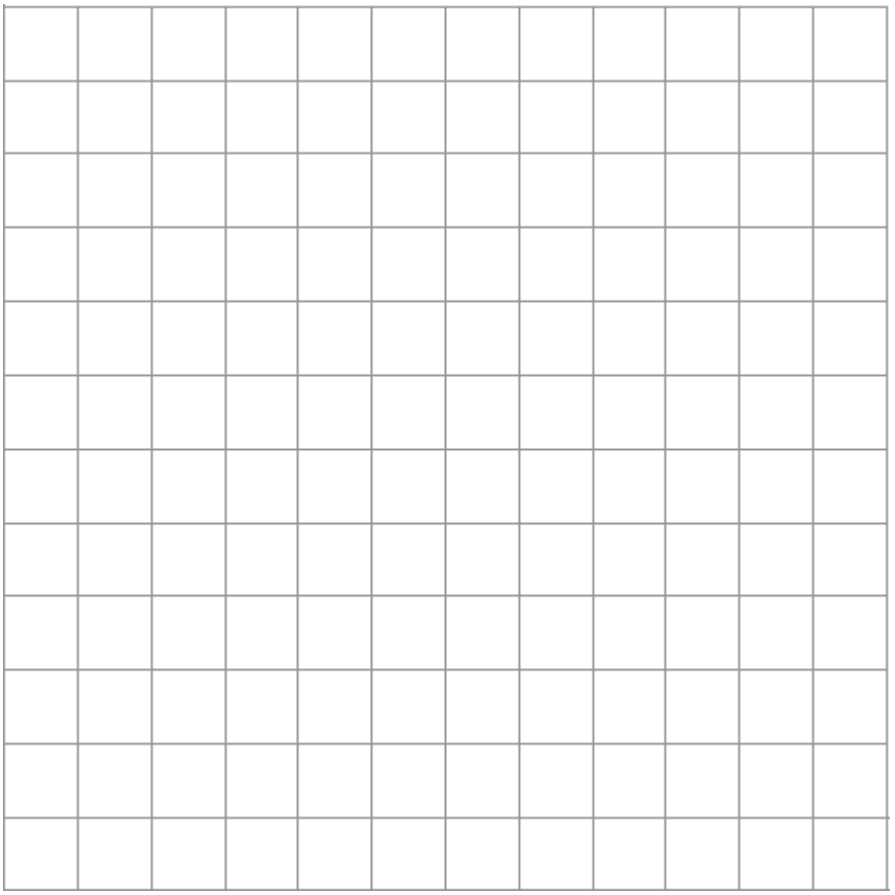
Answer _____ cm

(2)

(Total 4 marks)

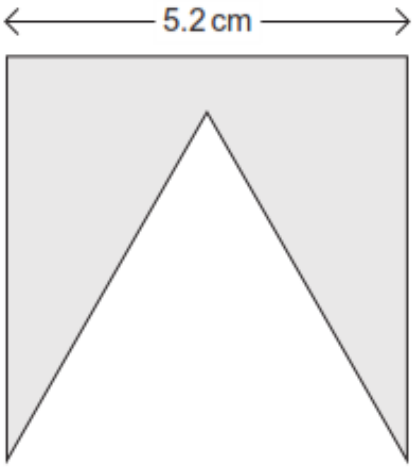
Q9. On this centimetre grid, draw **one** rectangle with

Perimeter = 20 cm and Area = 24 cm^2



(Total 2 marks)

Q11. This shape is made by cutting out an equilateral triangle from a square.



Not drawn accurately

Work out the perimeter of the shape.

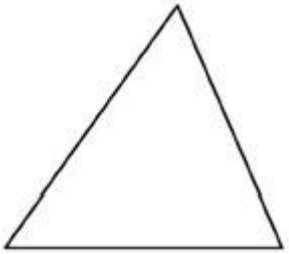
_____

_____

Answer _____ cm

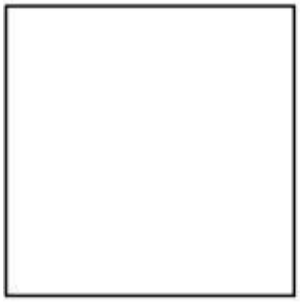
(Total 2 marks)

Q12. A triangle has perimeter 32 cm

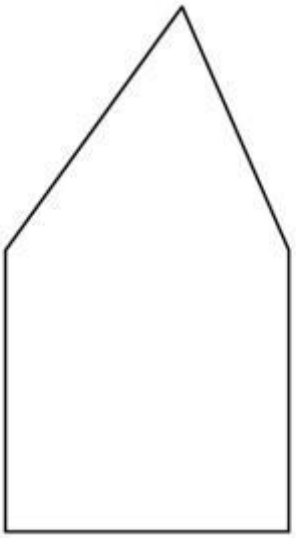


Not drawn accurately

A square has perimeter 40 cm



Two sides of the shapes are put together to make a pentagon.



Not drawn accurately

Work out the perimeter of the pentagon.

Answer _____ cm

(Total 4 marks)

Frequency Trees

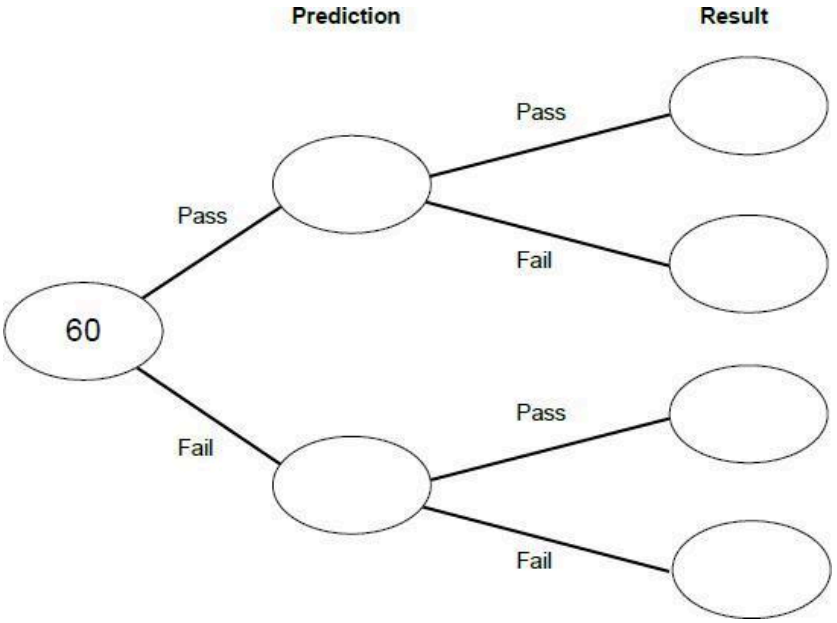
Q13. 60 people took a test. Before the test, they predicted whether they would pass or fail.

40 people predicted they would pass.

32 of the people who predicted they would pass did pass.

51 people passed altogether.

Complete the frequency tree.



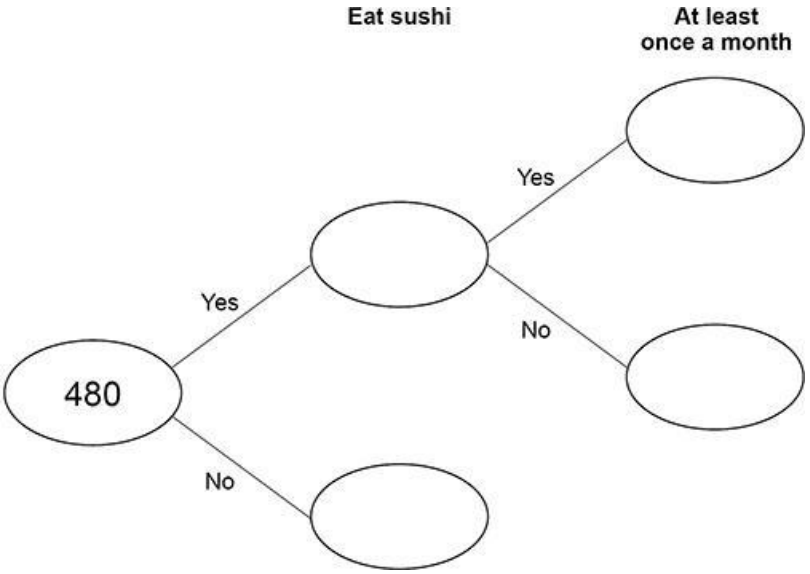
(Total 2 marks)

Q14. 480 people are asked if they eat sushi.

20% say Yes.

$\frac{2}{3}$ of the people who say Yes eat sushi at least once a month.

Complete the frequency tree.



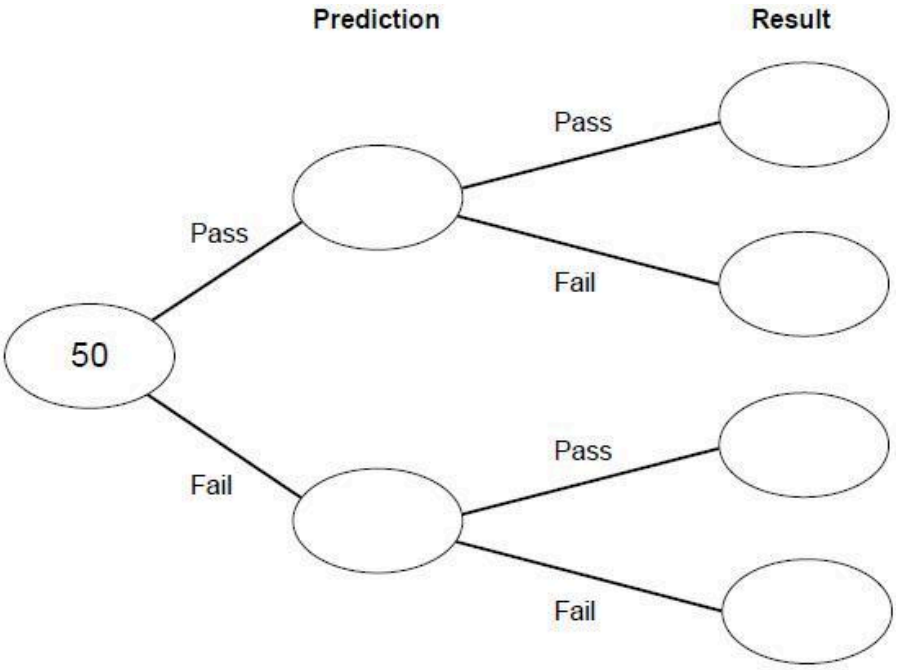
(Total 4 marks)

Q15. 50 people took a test. Before the test, they predicted whether they would pass or fail.

30 people predicted they would pass.

36 people did pass.
Of these 36 people, three times as many predicted pass as predicted fail.

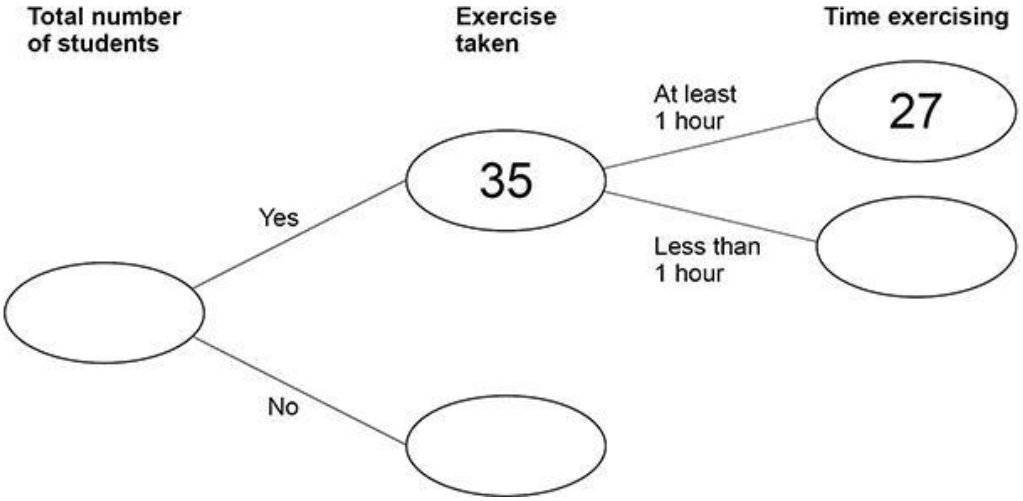
Complete the frequency tree.



(Total 3 marks)

Q16. Some students were asked about their daily exercise.

(a) 12 **more** students answered Yes than answered No. Complete the frequency tree.



(3)

(b) One of the 35 students who answered Yes is chosen at random.

What is the probability that they exercise for at least 1 hour?

Answer _____ **(1)**

(Total 4 marks)

Algebraic Expressions

Q17. Simplify fully $3a + 5c - a + 6c$

_____

_____

Answer _____

(Total 2 marks)

Q18. Simplify $7c + 5d - 4c + 3d$

_____

_____

Answer _____

(Total 2 marks)

Q19. Simplify $12x^2 - 8x^2 - 5x + 2x$

_____

_____

Answer _____

(Total 2 marks)

Q20. (a) Simplify $y \times y$

Answer _____ **(1)**

(b) Simplify $5a + 2 - a + 9$

_____

_____

Answer _____ **(2)**

(Total 3 marks)

Q21. Simplify fully $8a + 5b + 6a - 2b$

_____

_____

Answer _____

(Total 2 marks)

Q22. Simplify fully $(2 \times 4a) + 9 + \frac{15a}{3} - 7$

Answer _____

(Total 3 marks)

Q23. Simplify fully $d \times d$

Answer _____

(Total 1 mark)

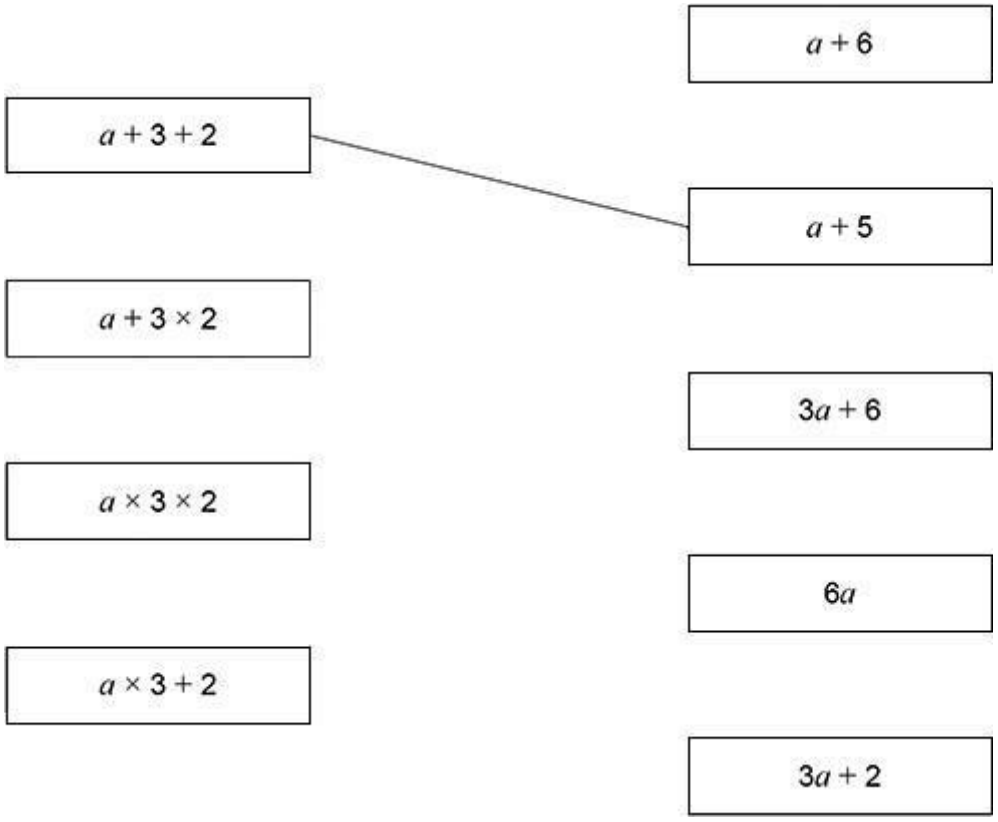
Q24. Simplify fully $p^2 \times p$

Answer _____

(Total 1 mark)

Q25. Match each expression on the left with one on the right.

One has been done for you.



(Total 3 marks)

Q26. Expand $w(w + 6)$

_____

Answer _____

(Total 2 marks)

Q27. Expand and simplify fully $5(3x + 4) – 2(x – 1)$

_____

_____

_____

Answer _____

(Total 2 marks)

Q28. Expand and simplify fully $4(2c + 3) – (5c – 1)$

_____

_____

Answer _____

(Total 2 marks)

Q29. (a) Multiply out $3(2x – 7)$

_____

Answer _____ **(1)**

(b) Factorise $x^2 + 8x$

_____

Answer _____ **(1)**

(Total 2 marks)

Q30. (a) Multiply out $3(2x + 5)$

_____

Answer _____ **(2)**

(b) Factorise $8x – 4$

_____

Answer _____ **(1)**

(Total 3 marks)

Q31. Factorise $21x + 28$

_____

_____

Answer _____

(Total 1 mark)

Q32. Factorise $15x + 5y$

_____

_____

Answer _____

(Total 1 mark)

Q33. Factorise $12a + 15b$

_____

_____

Answer _____

(Total 1 mark)

Q34. Factorise $15x + 35y - 40z$

_____

_____

Answer _____

(Total 1 mark)

Q35. Factorise fully $2x^2 + 6x$

_____

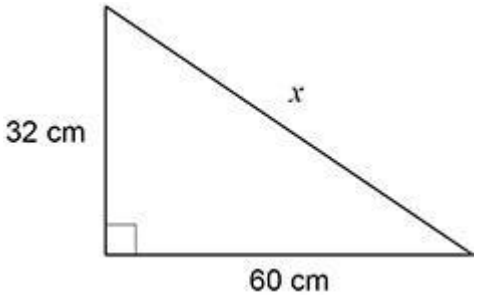
_____

Answer _____

(Total 2 marks)

Pythagoras' Theorem

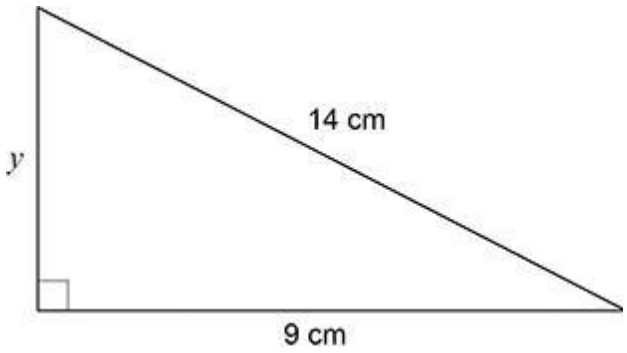
Q36. Use Pythagoras' theorem to work out the value of x. Not drawn accurately



Answer _____ cm

(Total 3 marks)

Q37. Here is a triangle.



Not drawn accurately

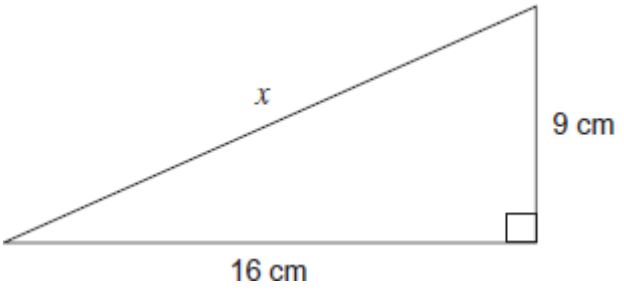
Use Pythagoras' theorem to work out the value of y.
Give your answer as a decimal.

y = _____ cm

(Total 3 marks)

Q38.

Not drawn accurately

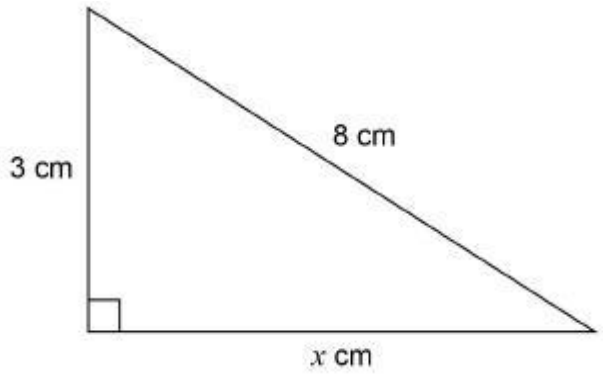


Work out the length x.
Give your answer to 1 decimal place.

Answer _____ cm

(Total 4 marks)

Q39.



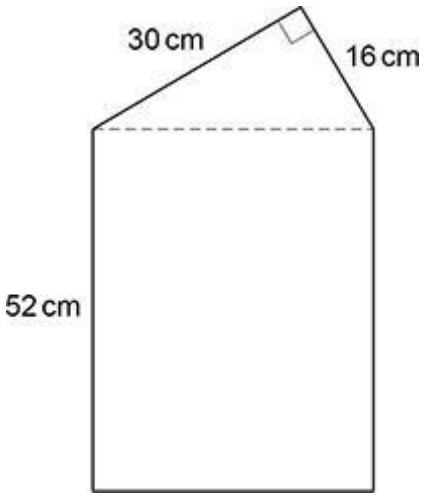
Not drawn accurately

Work out the value of x as a decimal.

Answer _____

(Total 3 marks)

Q40. A shape is made by joining a right-angled triangle to a rectangle.



Not drawn accurately

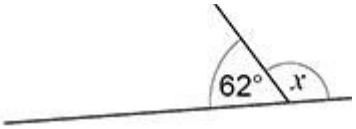
Work out the area of the shape.

Answer _____ cm^2

(Total 5 marks)

Angles

Q41. Here are two different straight lines.



Not drawn accurately

Work out the size of angle x.

_____

x = _____ degrees

(Total 1 mark)

Q42. In a triangle, two of the angles are 51° and 74°.

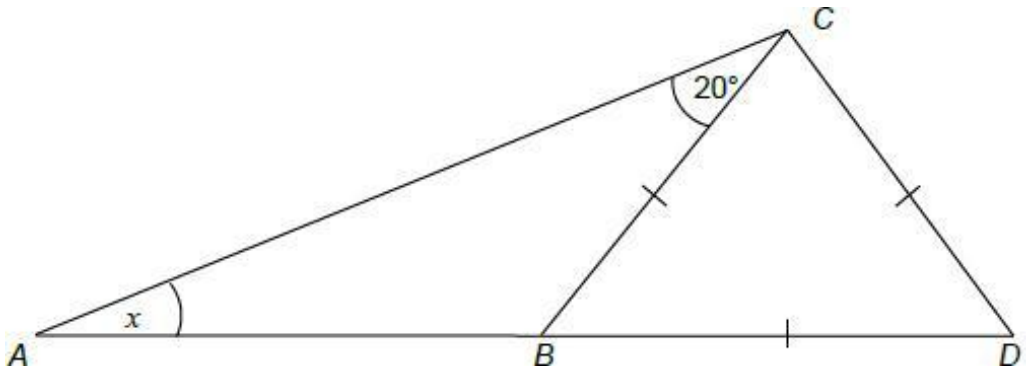
Work out the size of the third angle.

_____

Answer _____ degrees

(Total 1 mark)

Q43. The diagram shows a triangle *ACD* and an **equilateral** triangle *BCD*



Work out the size of angle x Not drawn accurately

_____

_____

_____

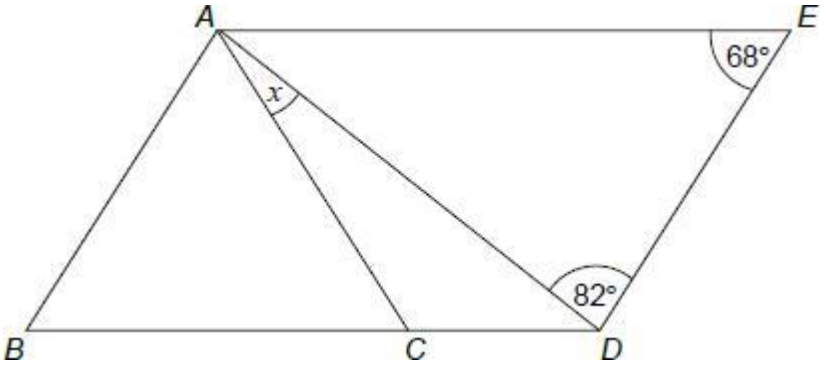
_____

Answer _____ °

(Total 3 marks)

Q44. *ABDE* is a parallelogram.

AB = *AC*



Not drawn accurately

Show that x = 38°

_____

_____

_____

_____

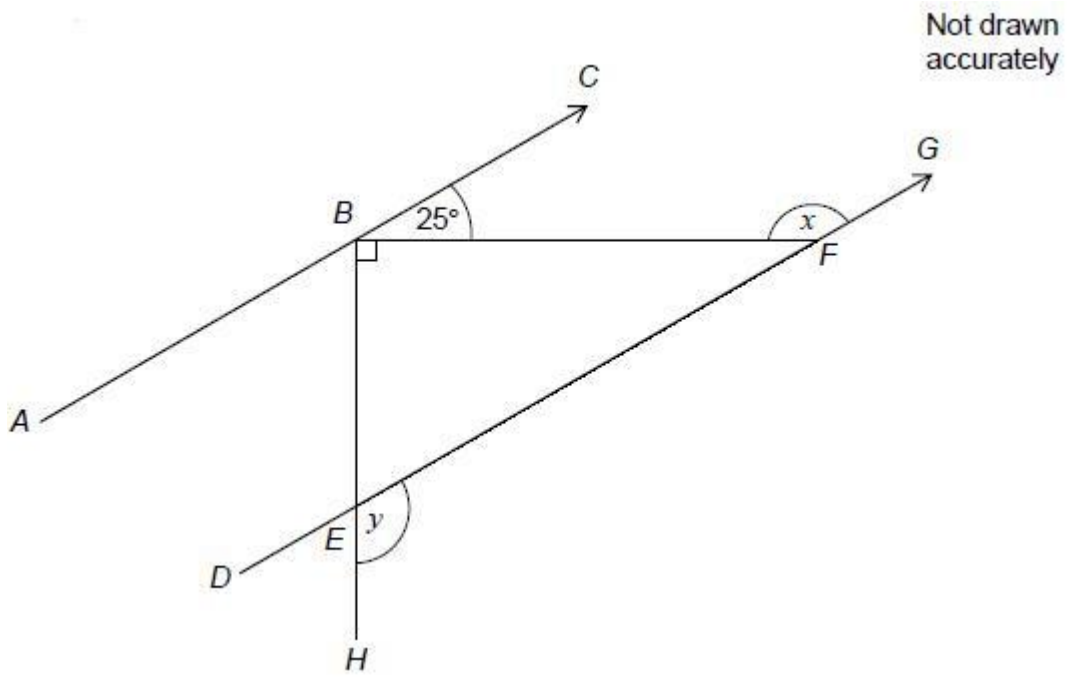
_____

_____

(Total 3 marks)

Q45. *ABC* and *DEFG* are parallel lines.

BEH is a straight line.



(a) Work out the size of angle x.

_____

x = _____ °

(1)

(b) Work out the size of angle y.

_____

_____

_____

_____

y = _____ °

(2)

(Total 3 marks)

Q46. (a) Part of a regular polygon is shown.



Not drawn accurately

Assume that the polygon is an octagon.

Work out the size of angle x.

Answer _____ °

(2)

(b) In fact, the polygon has **more** sides than an octagon.

What does this mean about the size of angle x ?
Tick **one** box.

- ☐ It is more than the answer to part (a)
- ☐ It is the same as the answer to part (a)
- ☐ It is less than the answer to part (a)
- ☐ It could be any of the above

(1)
(Total 3 marks)

Q47. Part of a regular polygon with 15 sides is shown.

Not drawn accurately



Work out the size of an **interior** angle.

Answer _____ degrees

(Total 2 marks)

Q48.

A regular polygon has an exterior angle of 20°

Work out the number of sides of the polygon.

Answer _____

(Total 2 marks)

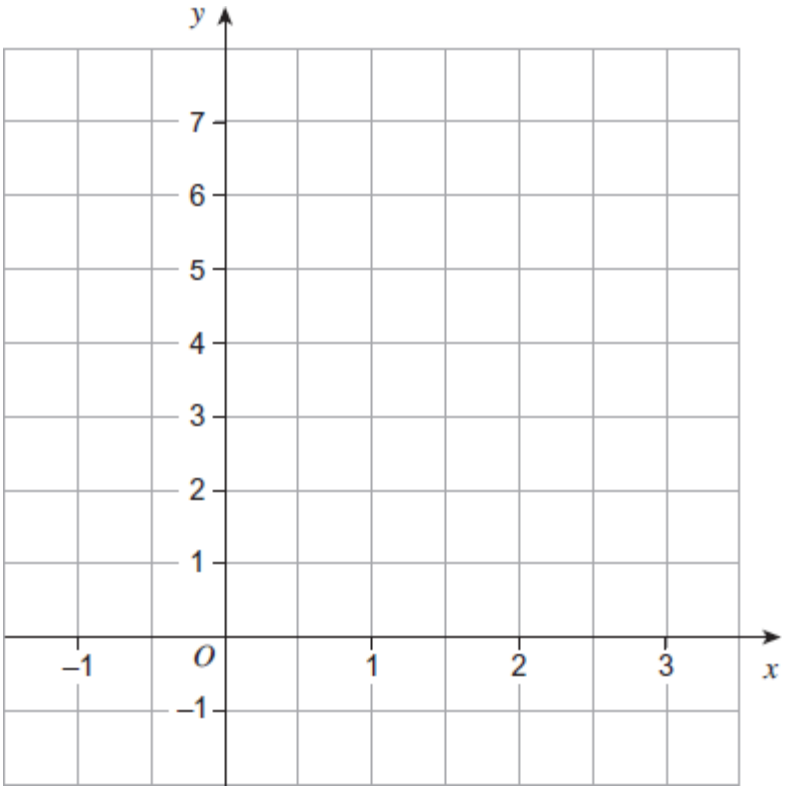
Linear Graphs

Q49. (a) Complete the table of values for $y = 2x + 1$

x	–1	1	3
y	–1	3	

(1)

(b) On the grid draw the graph of $y = 2x + 1$ for values of x from −1 to 3.



(2)

(c) On the grid draw the line $y = 5$

(1)

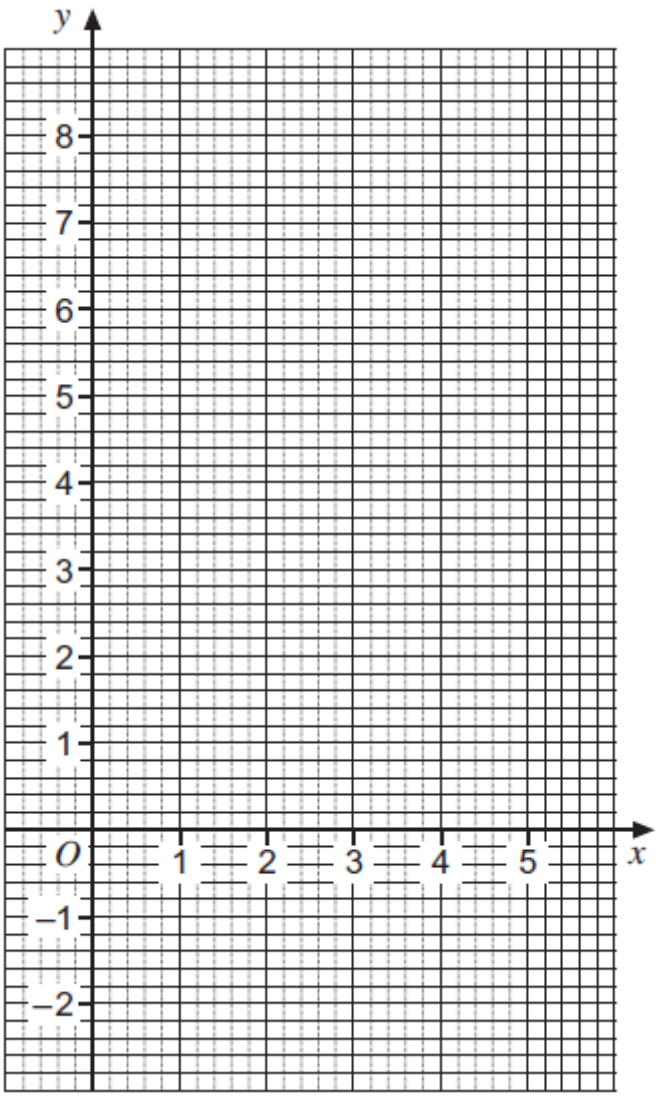
(Total 4 marks)

Q50. (a) Complete the table of values for $y = 8 - 2x$

x	0	1	2	3	4	5
y	8		4		0	

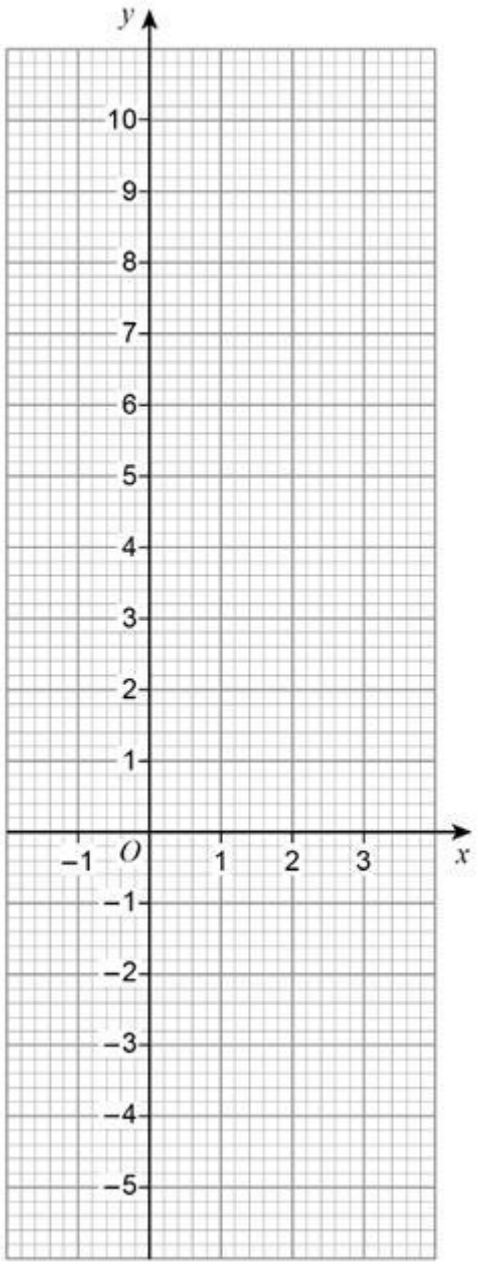
(2)

(b) On the grid below draw the graph of $y = 8 - 2x$ for values of x between 0 and 5.



(2)
(Total 4 marks)

Q51. Draw the graph of $y = 3x - 1$ for values of x from –1 to 3



(Total 3 marks)

Q52. A line has the equation $y = 3x - 5$

(a) Write down the gradient of the line.

Answer _____ **(1)**

(b) Write down the y-intercept of the line.

Answer _____ **(1)**

(Total 2 marks)

Q53. Work out the gradient of the straight line through (–2, 3) and (1, 9)

_____

_____

Answer _____

(Total 2 marks)

Q54. A straight line

has gradient 6 and

passes through the point (3, 19)

Work out the equation of the line.

Give your answer in the form $y = mx + c$

_____

_____

_____

_____

_____

_____

Answer _____

(Total 3 marks)

Q55. A straight line

has gradient 4 and

passes through the point (5, 23)

Work out the equation of the line.

Give your answer in the form $y = mx + c$

_____

_____

_____

_____

_____

Answer _____

(Total 3 marks)

Quadratic Graphs

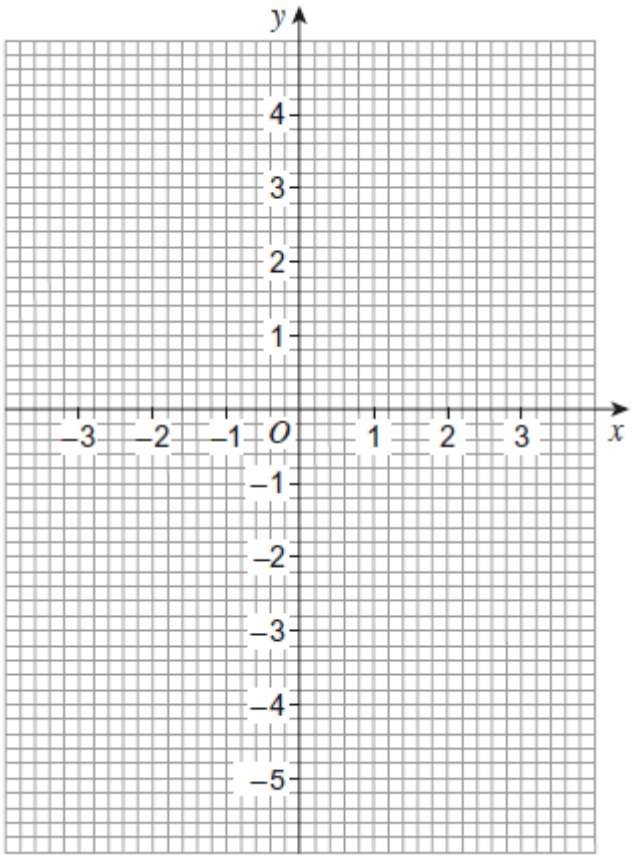
Q56.

(a) Complete the table of values for $y = x^2 - 5$ for values of x from –3 to 3

x	–3	–2	–1	0	1	2	3
y	4		–4			–1	4

(2)

(b) Draw the graph of $y = x^2 - 5$ for values of x from –3 to 3



(2)

(c) Use the graph of $y = x^2 - 5$ to write down the values of x when $y = 0$

Answer _____ and _____

(1)

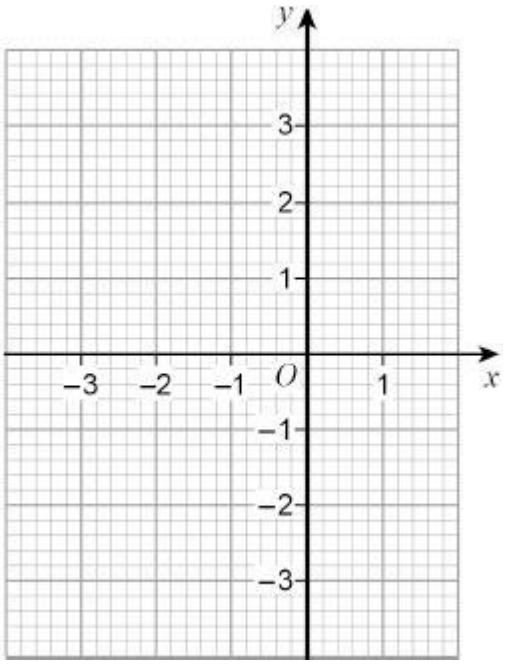
(Total 5 marks)

Q57. (a) Complete the table of values for $y = x^2 + 2x$

x	–3	–2	–1	0	1
y	3		–1	0	

(2)

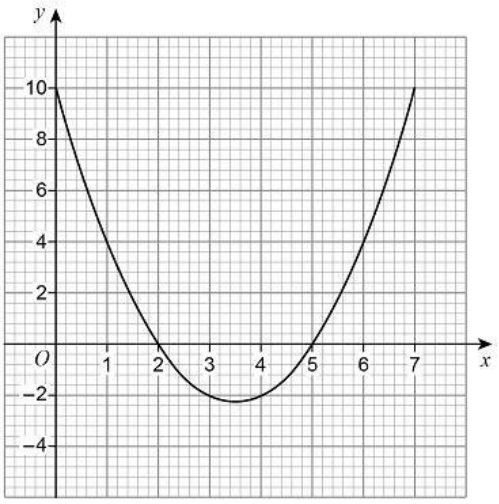
(b) Draw the graph of $y = x^2 + 2x$ for values of x from –3 to 1



(2)

(Total 4 marks)

Q58. Here is the graph of $y = x^2 - 7x + 10$ for values of x from 0 to 7



(a) Write down the roots of $x^2 - 7x + 10 = 0$

Answer _____ **(2)**

(b) Write down the x-coordinate of the turning point of the curve.

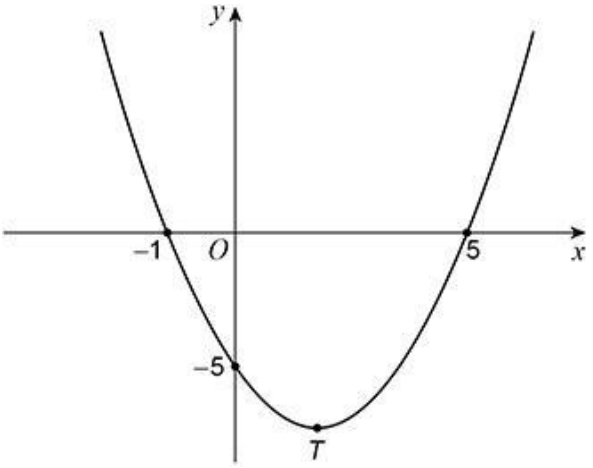
_____

Answer _____ **(1)**

(Total 3 marks)

Q59. Here is a sketch of the curve

$y = x^2 - 4x - 5$



(a) Write down the **two** roots of $x^2 - 4x - 5 = 0$

Answer _____ and _____ **(1)**

(b) Work out the coordinates of *T*, the turning point of the curve.

_____

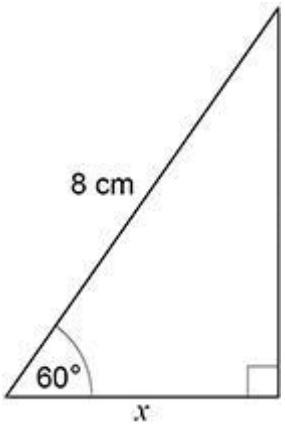
_____

Answer (_____ , _____) **(2)**

(Total 3 marks)

Trigonometry

Q60. Use trigonometry to work out the value of x.



Not drawn accurately

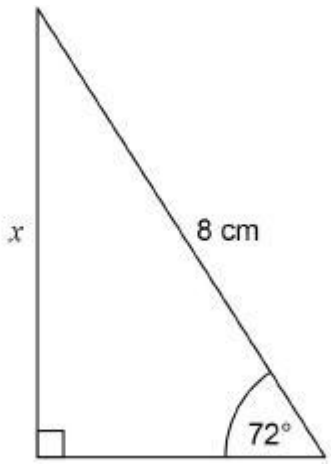
_____

_____

x = _____ cm

(Total 3 marks)

Q61. Use trigonometry to work out the length x.



Not drawn accurately

_____

_____

_____

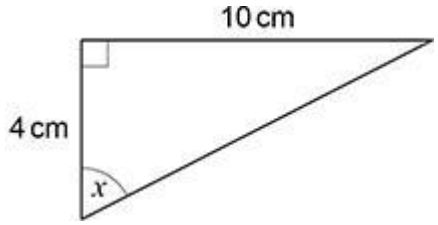
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_____

Answer _____ cm

(Total 2 marks)

Q62. Use trigonometry to work out the size of angle x.



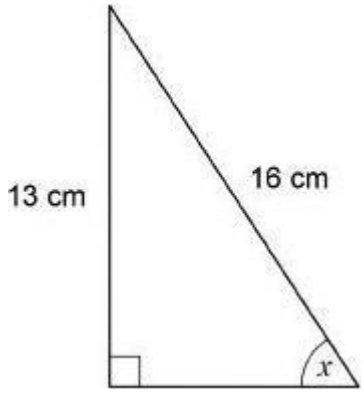
Not drawn accurately

x = _____ °

(Total 3 marks)

Q63. Here is a right-angled triangle.

Not drawn accurately



Use trigonometry to work out the size of angle x.

Answer _____ degrees

(Total 2 marks)

Quadratic Expressions and Equations

Q64. Solve $x^2 = 30.25$

_____

Answer _____

(Total 2 marks)

Q65. When $x^2 = 16$ the **only** value that x can be is 4

Is this true or false?

Tick a box.

True ☐ False ☐

Reason _____

_____

_____

(Total 1 mark)

Q66. Multiply out and simplify $(x - 8)^2$

_____

_____

_____

_____

Answer _____

(Total 2 marks)

Q67. Expand and simplify $(y + 8)(y - 3)$

_____

_____

_____

Answer _____

(Total 2 marks)

Q68. (a) Expand and simplify $(x + 6)(x – 3)$

_____

_____

_____

Answer _____

(2)

(b) Solve $(x – 9)(x + 4) = 0$

_____

_____

x = _____ or _____

(1)

(Total 3 marks)

Q69. (a) Expand and simplify $(x + 5)(x − 4)$

_____

_____

_____

Answer _____

(2)

(b) Solve $(x − 8)(x + 7) = 0$

_____

_____

_____

Answer _____

(1)

(Total 3 marks)

Q70. (a) Factorise $x^2 - 9x + 20$

_____

_____

_____

Answer _____

(2)

(b) Solve $x^2 - 9x + 20 = 0$

_____

_____

_____

Answer _____

(1)

(Total 3 marks)

Q71.

Factorise $x^2 - 100$

_____

_____

Answer _____

(Total 1 mark)

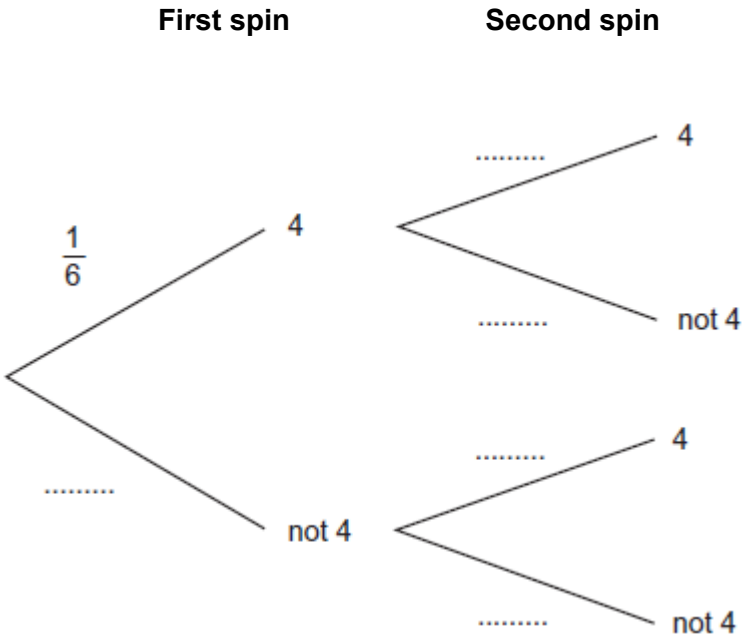
Tree Diagrams

Q72.

An ordinary fair dice is rolled.



(a) Complete the tree diagram for the dice landing on 4



(1)

(b) Work out the probability of the dice landing on 4 both times.

_____

_____

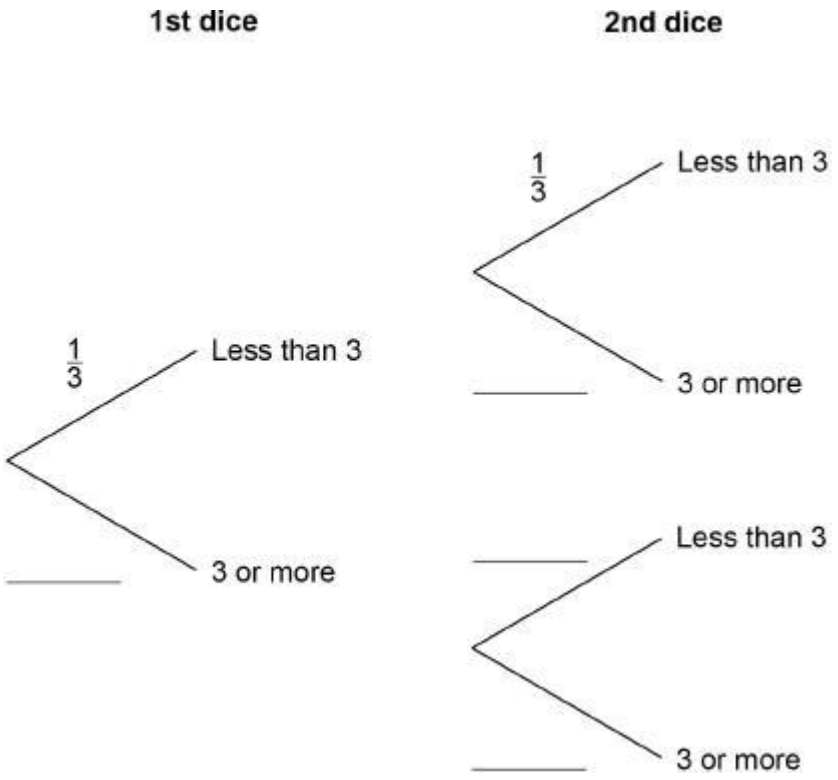
Answer _____

(2)

(Total 3 marks)

Q73. Two ordinary fair dice are rolled.

(a) Complete the tree diagram.



(1)

(b) Work out the probability that **both** dice land on a number less than 3

_____

_____

Answer _____

(1)

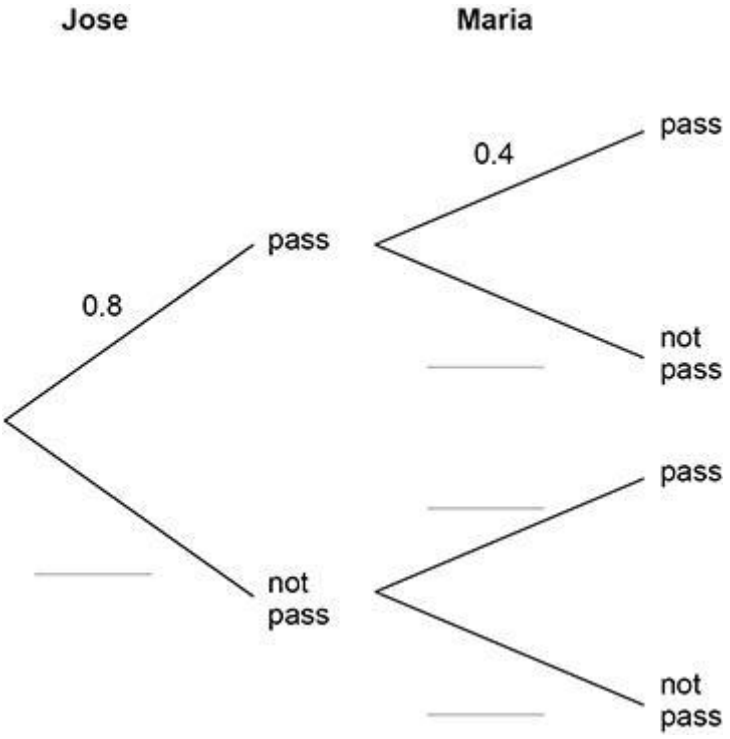
(Total 2 marks)

Q74. Jose and Maria each take a test.

The probability that Jose passes is 0.8

The probability that Maria passes is 0.4

(a) Complete the tree diagram.



(2)

(b) Work out the probability that they **both** pass.

Answer _____

(1)

(Total 3 marks)