




# JustMaths

Countdown to your final Maths exam ...  
Part 2 (2019)

## "WORKING ABOVE"

	Marks	Actual	  
Q1. Change the subject/Simultaneous equations	6		
Q2. Calculate with surds	3		
Q3. Change the subject	4		
Q4. Collect like terms, factorise, expand & simplify	7		
Q5. Surds	5		
Q6. Solve ratio and surd problem	3		
Q7. Change the subject	3		
Q8. Rationalise the denominator	3		
Q9. Rationalise the denominator to derive expression	3		
Q10. Triple brackets	3		
Q11. Quadratic sequences	3		
Q12. Area given in surd form	3		
Q13. Factorise, expand and simplify	5		
Q14. Factorise and solve quadratics	4		
Q15. Factorise and solve quadratics	3		

Q1. (a) Make  $t$  the subject of the formula

$$2(a + t) = 5t + 7$$

(3)

(b) Solve the simultaneous equations

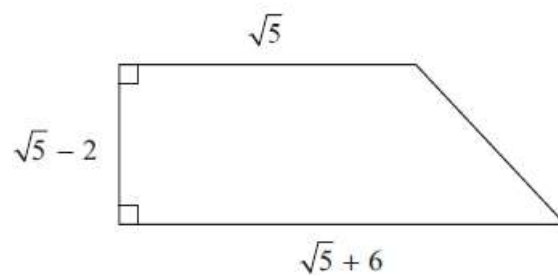
$$3x - 4y = 8$$

$$9x + 5y = -1.5$$

$$x = \dots\dots\dots$$

$$y = \dots\dots\dots (3)$$

Q2. Here is a trapezium.



All measurements shown are in centimetres.

Work out the area of the trapezium.

Give your answer in  $\text{cm}^2$  in the form  $a\sqrt{5} + b$  where  $a$  and  $b$  are integers.

(3)

Q3. Make  $x$  the subject of the formula  $y = \frac{x^2 + 9}{x^2 - 7}$

(4)

Q4. (a) Simplify  $3y + 2x - 4 + 5x + 7$

(1)

(b) Factorise  $2x^2 - 4x$

(2)

(c) Expand and simplify  $11 - 3(x + 2)$

(2)

(d) Expand and simplify  $(x - 6)(3x + 7)$

(2)

Q5.  $\frac{1 + \sqrt{2}}{(3 - \sqrt{2})^2}$  can be written in the form  $a + b\sqrt{2}$  Find the value of  $a$  and the value of  $b$ .

(5)

Q6.  $a = \sqrt{7} + \sqrt{c}$  and  $b = \sqrt{63} + \sqrt{d}$  and where  $c$  and  $d$  are positive integers.

Given that  $c : d = 1 : 9$  find, in its simplest form, the ratio  $a : b$

(3)

Q7. Make  $x$  the subject of the formula  $y = \frac{3x}{x+5}$

(3)

Q8. Rationalise the denominator of  $\frac{(4 + \sqrt{2})(4 - \sqrt{2})}{\sqrt{7}}$  Give your answer in its simplest form.

(3)

Q9. Show that  $\frac{3 + \sqrt{2}}{5 + \sqrt{8}}$  can be written as  $\frac{11 - \sqrt{2}}{17}$

(3)

Q10. Show that  $(x + 1)(x + 2)(x + 3)$  can be written in the form  $ax^3 + bx^2 + cx + d$  where  $a, b, c$  and  $d$  are positive integers.

Q11. Here are the first 7 terms of a quadratic sequence.

3    6    11    18    27    38    51

(a) Find an expression, in terms of  $n$ , for the  $n$ th term of this sequence.

(b) Find the 50th term of this sequence.

Q12. The perimeter of a square is  $\sqrt{120}$  cm. Work out the area of the square.

Give your answer in its simplest form.

Q13. (a) Factorise  $2ax - 2ay + bx - by$

(b) Expand and simplify  $(n + 2)^2 + (n - 3)^2$

Q14. (a) (i) Factorise  $x^2 - 12x + 27$

(ii) Solve the equation  $x^2 - 12x + 27 = 0$

(b) Factorise  $y^2 - 100$

Q15. Solve, by factorising, the equation  $8x^2 - 30x - 27 = 0$

(3)

(2)

(1)

(3)

(2)

(3)

(3)

(1)

(3)