

# ONE-WEEK HOLIDAY CHALLENGE (H)

HOW MANY CAN YOU DO? ... HOW MANY WILL YOU DO?

DAY 1	DAY 2	DAY 3	DAY 4	DAY 5	DAY 6	DAY 7
Write 300 as a product of prime factors using index notation.	Simplify .. $q \times q \times q + r \times r$	Work out $\frac{5}{\sqrt{2}} + \frac{8}{\sqrt{32}}$	$x$ is inversely proportional to $y$ $x = 15$ and $y = 0.3$ What is $x$ when $y = 4$ ?	Write $16^{10}$ as a single power of 2	Solve: $y = 2x^2 - 7x + 4$ $y = 4x - 1$	Continue this sequence $a, b, a + b, \dots, \dots,$
Solve $5(x^2 + 2x) = 73$ .	Rationalise the denominator $\frac{7}{2 + \sqrt{3}}$	Make " $x$ " the subject  $y = \frac{4 + x}{w - 3x}$	Solve: $x + y = 6$ $y - x = 8$	Find the value of $\frac{1.6 \times 10^7}{2 \times 10^2}$	What is the value of " $x$ "? $9^{18} = 27^x$	$y$ is proportional to the cube of $x$ When $x = 2$ , $y = 28.8$ Find $x$ when $y = 450$
rationalise the denominator $\frac{4 + 2\sqrt{5}}{\sqrt{5} - 1}$	A straight line has a gradient of 2 and passes through the point (0, 4). Find the equation of the line	Write $\sqrt{12} + \sqrt{75}$ in the form $k\sqrt{3}$ .	Prove that the difference between two consecutive square numbers is always odd.	What is the area of a rectangle with sides $\sqrt{45}$ and $\sqrt{30}$ ?	A triangle has sides 4, 5 and 6.4cm. Its area is $10\text{cm}^2$ . How long are the sides of a similar triangle with an area of $90\text{cm}^2$ ?	Calculate: $3\frac{1}{5} - 1\frac{2}{7}$
$y$ is inversely proportional to $x^2$ $y = 5$ when $x = 4$ . Find a formula linking $x$ and $y$ .	$p = \binom{4}{3}$ $q = \binom{1}{-1.5}$ Work out $2p - q$	$a : b = 4 : 5$ and $b : c = 7 : 11$ . Find the ratio $a : c$	Write down the four values for which $\sin x = -0.5$	Write the expression $x^2 - 6x + 19$ in the form $(x + a)^2 + b$ ,	$f(x) = 5x + 2$ Solve $f^{-1}(x) = 10$	There are 5 cherry sweets, 4 lemon sweets and 1 orange sweet. A sweet is chosen at random and eaten. Another sweet is then taken. What is the probability of getting 2 different flavours?
Simplify fully; $\frac{x^2 + 5x + 4}{x^2 - 3x - 28}$	Write as a power of 2 $\sqrt[3]{64} \times 2^{-4} \times 4^9$	Evaluate $16^{-\frac{3}{4}}$	How many different 5-digit whole numbers can be made using the digits: 2, 3, 4, 5, and 6 when each digit can be used once only?	Expand & Simplify: $(x - 4)^2 - 9$	Solve the equation $8 \sin x = 2.5$ for the interval $0^\circ$ to $720^\circ$	Simplify: $3a^2 \times 6a^{-1}$
Simplify fully; $\frac{x^2 + 14x + 49}{x^2 - 49}$	The angles in a triangle are in the ratio 1 : 2 : 3 Is the triangle right angled?	What is the equation of a circle, centre (0,0) radius 4 units?	Expand & Simplify: $(2x - 1)(x + 5)(3x - 2)$	Calculate the surface area of a cylinder with radius 8cm and height 12cm	$\frac{2}{5}$ of a number is 16. What is one quarter of the number?	Solve : $11x - 3 = 9x + 25$
What are the coordinates of the turning point of the curve $y = x^2 - 6x + 30$ .	Factorise $\frac{x^2}{25} - \frac{y^2}{49}$	What is the $n$ th term rule: 3 8 15 24 35	Simplify: $16\pi \div 4\pi$	Given $145 \times 6.5 = 942.5$ What is $1.45 \times 65$ ?	Solve : $x^2 - 6x + 15 = 3x - 5$	Estimate $5.1^4$
4 workers can move 5 tonnes of goods in 3 hours. How long would it take 6 workers to move 10 tonnes of goods?	Expand: $(x^2 + 2x + 1)(x^2 + x + 2)$	$y = 3.6$ to 1 d.p. What are the upper and lower bounds?	SOLVE: $\frac{5x + 7}{14} = \frac{1 - 2x}{21}$			