

| Pupils should be familiar with (most of) these TOPICS | → Pupils should be able to solve (most of) these EXERCISES |
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| REAL NUMBERS | |
| <ul style="list-style-type: none"> Ⓢ Family tree of numbers (natural numbers, integers, rational numbers, real numbers) Ⓢ Square roots | <ul style="list-style-type: none"> Ⓢ Simplify: $\sqrt{2} \cdot (\sqrt{2} + \sqrt{8}) =$ Ⓢ Simplify: $\frac{\sqrt{24 \cdot a}}{\sqrt{6 \cdot a}} =$ |
| ALGEBRA | |
| <ul style="list-style-type: none"> Ⓢ Exponents Ⓢ Algebraic expressions <ul style="list-style-type: none"> ✓ adding, subtracting, multiplying, dividing ✓ expanding, factorising Ⓢ Binomial expansion <ul style="list-style-type: none"> ✓ $(a + b)^2 = a^2 + 2ab + b^2$ ✓ $(a - b)^2 = a^2 - 2ab + b^2$ ✓ $a^2 - b^2 = (a - b)(a + b)$ Ⓢ Algebraic fractions | <ul style="list-style-type: none"> Ⓢ Simplify: $(2a^2)^4 =$ Ⓢ Simplify: $3x + 2xy - 5x^2 - 15x - 10xy =$ Ⓢ Expand: $(3a - 5b)(2a + 3b) =$ Ⓢ Expand: $(2x - 1)^2 =$ Ⓢ Factorise: $9a^2 - 12a + 4 =$ Ⓢ Simplify: $\frac{27a^4b^7}{3a^2 - 6a + 3} : \frac{9ab^3}{(a - 1)^3} =$ Ⓢ Simplify: $\frac{x}{x + 5} + \frac{7x + 10}{x^2 + 5x} =$ |
| LINEAR EQUATIONS | |
| <ul style="list-style-type: none"> Ⓢ Solving linear equations | <ul style="list-style-type: none"> Ⓢ Solve: $x(3x - 5) = 2x^2 - (5 - x)x$ |
| PYTHAGOREAN THEOREM | |
| <ul style="list-style-type: none"> Ⓢ Theorem of Pythagoras Ⓢ Problem solving with the Pythagorean theorem | <ul style="list-style-type: none"> Ⓢ The roof of a house is 12 m above the ground. To make it safe, the bottom of the ladder must be placed 5 m away from the wall. How long must the ladder be to reach the roof safely? Ⓢ ABCD is a kite: AB = 5.4 cm, BC = 8.5 cm and BD = 7.6 cm. Calculate the length of AC and the area of the kite. |
| FUNCTIONS | |
| <ul style="list-style-type: none"> Ⓢ Definition of a function Ⓢ Linear functions | <ul style="list-style-type: none"> Ⓢ Plot the graph of the linear function $y = -x + 2$. |
| SIMULTANEOUS EQUATIONS | |
| <ul style="list-style-type: none"> Ⓢ Using graphs to solve simultaneous equations Ⓢ Solving simultaneous equations with algebra | <ul style="list-style-type: none"> Ⓢ Solve this pair of simultaneous equations graphically and algebraically (elimination, substitution, ...): I: $2x + 3y = 9$ II: $x + 4y = 7$ |
| THE GEOMETRY OF CIRCLES | |
| <ul style="list-style-type: none"> Ⓢ Area and perimeter of a circle Ⓢ Arc of a sector | <ul style="list-style-type: none"> Ⓢ A circle has a radius of 24 cm. The arc of a sector of this circle has a length of 8 cm. Calculate the angle of this sector and the area of the circle. |
| GEOMETRY IN THREE DIMENSIONS | |
| <ul style="list-style-type: none"> Surface area and volume of Ⓢ cuboids Ⓢ prisms Ⓢ pyramids Ⓢ spheres | <ul style="list-style-type: none"> Ⓢ Calculate the surface area and the volume of the cuboid: $a = 15 \text{ cm}, b = 5 \text{ cm}, c = 3 \text{ cm}$. Ⓢ A square pyramid of height 12 cm has a volume of 784 cm^3. Calculate the length of each side of the base. |