MathsBox

Level 2

QUESTION GENERATOR OVERVIEW

Question structures for Level 2 Further Maths.

Every question structure available for Level 2 Further Maths in the Mathsbox Question Generator, organised by topic so you can find exactly what you need.

Number | Algebra | Functions and Graphs | Coordinate Geometry | Calculus | Matrices | Geometry

579 question structures

41 topics

7 strands

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01 LEVEL 2 FURTHER MATHS Number

5 topics
56 structures

Fractions 9

- Mixed numbers to improper fractions
- Improper fractions to mixed numbers
- Multiply a pair of proper fractions
- Divide any pair of proper fractions
- Adding mixed numbers
- Subtract mixed numbers
- Non-unit fraction of a quantity
- Recurring decimals as fractions
- Fractions : Mixture

Percentages 7

- Calculating a percentage of a quantity
- Increasing by a given percentage
- Decreasing by a given percentage
- Expressing as a percentage
- Finding the original < 100%
- Finding the original > 100%
- Percentages : Mixture

Ratio 17

- Simplifying ratios
- Simplifying ratios
- Simplifying ratios (mixed units)
- Expressing in the form $1:n$ or $n:1$
- Dividing in a given ratio
- Dividing in a given ratio - difference known
- Dividing in a given ratio - one share
- Find the larger share - smaller known
- Find the larger share - difference known
- Find the smaller share -larger known
- Find the smaller share - difference known
- Given $a:b$ and $b:c$ - find $a:c$

Ratio *continued*

- Given $a:b$ and $b:c$ - express as a fraction
- Given $a:b$ and $b:c$ -calculate a quantity
- Given $n:a=m:b$ and $b:c$ - find $a:b:c$
- Given $n:a=m:c$ and $b:c$ - find $a:c$
- Ratio : Mixture

Combinations 4

- Dials
- Dials - multiples of 5 or 10
- Dials - Odd and even
- Combinations : Mixture

Surds 19

- Simplifying :$\sqrt{a}$
- Simplifying :$\sqrt{a}\pm b+\sqrt{a}\pm c$
- Simplifying :$n\sqrt{a}\pm b+m\sqrt{a}\pm c$
- Simplifying :$n\sqrt{a}+\sqrt{b}$
- Simplifying :$n\sqrt{a}\times m\sqrt{a}$
- Simplifying :$\sqrt{a}\times\sqrt{b}$
- Simplifying :$m\sqrt{a}\times n\sqrt{b}$
- Simplifying
- Expanding brackets :$\sqrt{a}(a\sqrt{b}\pm c)$
- Expanding brackets : $\sqrt{a}(b\pm\sqrt{a})$
- Expanding brackets :$a\sqrt{b}(c\sqrt{d}\pm e)$
- Expanding brackets : $(\sqrt{a}\pm b)(\sqrt{a}\pm c)$
- Expanding brackets : $(a\sqrt{b}\pm c)(d\sqrt{b}\pm e)$
- Expanding mixture
- Rationalising the denominator :$\frac{a}{\sqrt{b}}$
- Rationalising the denominator :$\frac{a}{c\pm\sqrt{b}}$
- Rationalising the denominator :$\frac{a\pm\sqrt{b}}{c\pm\sqrt{b}}$
- Rationalising the denominator mixture
- Surds : Mixture

02 LEVEL 2 FURTHER MATHS Algebra

13 topics
204 structures

Simplifying and Expanding brackets · Simplifying 8

- Collecting like terms - Two variables
- Collecting like powers of a variable
- Multiplying terms
- Multiplying terms : $a\times x\times b\times x$
- Multiplying terms : $ax\times bx$
- Dividing terms
- Dividing terms :$ax\div b$
- Simplifying : Mixture

Simplifying and Expanding brackets · Expanding brackets 25

- Expanding $a(bx\pm c)+d(ex\pm f)$
- Expanding $a(bx\pm c)-d(ex\pm f)$
- Expanding$(x\pm a)(x\pm b)$
- Expanding $(ax\pm b)(cx\pm d)$
- Expanding : $(1+x)^n$
- Expanding : $(1-x)^n$
- Expanding : $(a+x)^n$
- Expanding : $(a-x)^n$
- Expanding : $(x+a)^n$

Simplifying and Expanding brackets · Expanding brackets *continued*

- Expanding : $(x-a)^n$
- Expanding :$(1+ax)^n$
- Expanding :$(1-ax)^n$
- Expanding :$(a+bx)^n$
- Expanding :$(a-bx)^n$
- Expanding :$(ax+b)^n$
- Expanding :$(ax-b)^n$
- Specific terms : $(1+bx)^n$
- Specific terms : $(1-bx)^n$
- Finding b : $(1+bx)^n$
- Finding b : $(1-bx)^n$
- Specific terms : $(a+bx)^n$
- Specific terms : $(a-bx)^n$
- Finding b : $(a+bx)^n$
- Finding b : $(a-bx)^n$
- Expanding brackets : Mixture

Algebraic Fractions 16

Simplify : $\frac{x}{a}+\frac{x}{b}$
Simplify : $\frac{x}{a}-\frac{x}{b}$
Simplify : $\frac{ax}{b}+\frac{cx}{d}$
Simplify : $\frac{ax}{b}-\frac{cx}{d}$
Simplify : $\frac{x+a}{b}+\frac{x+c}{d}$
Simplify : $\frac{x+a}{b}-\frac{x+c}{d}$
Simplify : $\frac{x+a}{b}-\frac{x-c}{d}$
Simplify : $\frac{x-a}{b}-\frac{x+c}{d}$
Simplify : $\frac{x-a}{b}-\frac{x-c}{d}$
Simplify : $\frac{x-a}{b}+\frac{x-c}{d}$
Simplify : $\frac{x+a}{b}-\frac{x-c}{d}$
Multiply algebraic fractions
Multiply algebraic fractions
Divide algebraic fractions
Divide algebraic fractions
Algebraic Fractions : Mixture

Rearranging formula 26

Rearrange complex : - $y=\sqrt{x+a}$
Rearrange complex : $y=\sqrt{x-a}$
Rearrange complex : $y=\sqrt{a-x}$
Rearrange complex : $y=\frac{\sqrt{x}}{a}$
Rearrange complex : $y=\frac{a}{\sqrt{x}}$
Rearrange complex : $y=\sqrt{\frac{a}{x}}$
Rearrange complex : $y=\sqrt{\frac{x}{a}}$
Rearrange complex : $y=\sqrt{x}+a$
Rearrange complex : $y=\sqrt{x}-a$
Rearrange complex : $y=-\sqrt{x}$
Subject appears twice $ax=bx+c$
Subject appears twice $ax=c-bx$
Subject appears twice $ax+b=cx+d$
Subject appears twice $ax-b=cx+d$
Subject appears twice $ax-b=d-cx$
Subject appears twice $ax+b=d-cx$
Subject appears twice $\frac{x+a}{x+b}=c$
Subject appears twice $\frac{x-a}{x+b}=c$
Subject appears twice $\frac{x+a}{x-b}=c$
Subject appears twice $ax-b=cd-dx$
Subject appears twice $\frac{x}{x-b}=c$
Subject appears twice $\frac{x}{x+b}=c$
Subject appears twice $\frac{ax+b}{cx+d}=e$
Subject appears twice $\frac{ax-b}{cx+d}=e$
Subject appears twice $\frac{ax-b}{cx-d}=e$
Rearranging formula:Mixture

Factorising and completing the square · Factorising 9

Factorising $x^2\pm bx\pm c$
Factorising $ax^2\pm bx\pm c$
Verifying a factor
Factorising a cubic
Factorising a quartic
Solving a cubic equation
Solving a quartic equation
Polynomial Division
Factorising : Mixture

Factorising and completing the square · Completing the square 8

Completing the square $x^2+px+q=(x+a)^2+b$
Completing the square $x^2-px+q=(x-a)^2+b$
Completing the square $x^2\pm px\pm q=(x\pm a)^2+b$
Completing the square $q-x^2\pm p=b-(x\pm a)^2$
Completing the square $px^2-qx+r=a(x\pm b)^2+c$
Completing the square $px^2-px+r=a(x\pm b)^2+c$
Completing the square $r-px^2\pm q=c-a(x\pm b)^2$
Completing the square : Mixture

Solving equations · Solving linear equations 23

Solving Equations $ax\pm b=cx\pm d$
Solving Equations $a(bx\pm c)=dx\pm e$
Solving Equations $\frac{x}{a}+b=cx+d$
Solving Equations $\frac{x}{a}-b=cx+d$
Solving Equations $\frac{x}{a}+b=cx-d$
Solving Equations $\frac{x}{a}-b=cx-d$
Solving Equations $b-\frac{x}{a}=cx+d$
Solving Equations $b-\frac{x}{a}=cx+d$
Solving Equations $\frac{x}{a}+b=\frac{x}{c}+d$
Solving Equations $\frac{x}{a}-b=\frac{x}{c}+d$
Solving Equations $\frac{x}{a}+b=\frac{x}{c}-d$
Solving Equations $\frac{x}{a}-b=\frac{x}{c}-d$
Solving Equations $\frac{x}{a}+b=d-\frac{x}{c}$
Solving Equations $\frac{x}{a}-b=d-\frac{x}{c}$
Solving Equations $\frac{x}{a}+\frac{x}{b}=c$
Solving Equations $\frac{x}{a}-\frac{x}{b}=c$
Solving Equations $\frac{x}{a}+\frac{x}{b}=cx+d$
Solving Equations $\frac{x}{a}-\frac{x}{b}=cx+d$
Solving Equations $\frac{x}{a}+\frac{x}{b}=cx-d$
Solving Equations $\frac{x}{a}-\frac{x}{b}=cx-d$
Solving Equations $\frac{x}{a}+\frac{x}{b}=e-dx$
Solving Equations $\frac{x}{a}-\frac{x}{b}=e-dx$
Linear equations : Mixture

Solving equations · Solving quadratic equations 20

Factorise and solve mixture $x^2\pm bx\pm c=0$
Factorise and solve mixture $ax^2\pm bx\pm c=0$
Difference of 2 squares: $x^2-b^2=0$
Difference of 2 squares: $a^2x^2-b^2=0$
Quadratic formula $x^2\pm bx\pm c=0$
Quadratic formula $ax^2\pm bx\pm c=0$
Quadratic formula - rearrange and solve
Equations : $\frac{a}{x}+\frac{b}{x+c}=d$
Equations : $\frac{a}{x}-\frac{b}{x+c}=d$
Equations : $\frac{a}{x}+\frac{b}{x-c}=d$
Equations : $\frac{a}{x-c}-\frac{b}{x}=d$
Equations : $\frac{a}{x+b}+\frac{c}{x+d}=e$
Equations : $\frac{a}{x+b}-\frac{c}{x+d}=e$
Equations : $\frac{a}{x-b}-\frac{c}{x+d}=e$
Equations : $\frac{a}{x-b}-\frac{c}{x-d}=e$
Solving : $ax^4+bx^2+c=0$
Solving : $ax^{2/n}+bx^{1/n}=c$
Solving : $\sqrt{x}+b=cx$
Solving : $ax+\frac{c}{x}=b$
Quadratic equations : Mixture

Solving equations · Solving simultaneous equations 22

Simultaneous equations: $ax+by=r$ and $cx+dy=s$
Simultaneous equations: $ax-by=r$ and $cx-dy=s$
Simultaneous equations: $ax-by=r$ and $cx+dy=s$
Simultaneous equations: $ax+by=r$ and $cx-dy=s$
Simultaneous equations: $x+y=s$ and $xy=p$
Simultaneous equations: $ax+y=c$ and $x^2+by=d$
Simultaneous equations: $y=mx$ and $y=x^2\pm c$
Simultaneous equations: $y=x\pm a$ and $y=x^2\pm b$
Simultaneous equations:$y=x^2+bx+c$ and $y=dx+e$
Simultaneous equations: $ax^2\pm by^2=c$ and $x+y=d$
Simultaneous equations: $x^2+y^2\pm xy=c$ and $x+y=d$
Simultaneous equations: $x^2+y^2\pm axy=c$ and $x+y=d$
Simultaneous equations: $x^2+y^2\pm ax=c$ and $x+y=d$
Simultaneous equations: $x^2+y^2\pm ay=c$ and $x+y=d$
Simultaneous equations: $x^2\pm axy^2\pm by=c$ and $x+y=d$
Simultaneous equations: $x^2+y^2=r^2$ and $y=x\pm c$
Simultaneous equations: $x^2+y^2=r^2$ and $y=ax\pm c$
Simultaneous equations - 3 variables z
Simultaneous equations - 3 variables y
Simultaneous equations - 3 variables x

Solving equations · Solving simultaneous equations *continued*

Simultaneous equations - 3 variables - mixture
Simultaneous equations : Mixture

Solving inequalities · Solving linear inequalities 10

Solving : $ax + b < cx + d$
Solving : $ax - b < cx + d$
Solving : $ax + b < cx - d$
Solving : $ax - b < cx - d$
Solving : $ax + b < d - cx$
Solving : $ax - b < d - cx$
Solving : $a < bx + c < d$
Solving : $a < bx - c < d$
Solving : $a < b - cx < d$
Linear inequalities : Mixture

Solving inequalities · Solving quadratic inequalities 9

Solving :$x^2 - bx + c \geq 0$
Solving :$x^2 - bx + c \leq 0$
Solving :$x^2 - bx - c \geq 0$
Solving :$x^2 - bx - c \leq 0$
Solving :$x^2 + bx - c \geq 0$
Solving :$x^2 + bx - c \leq 0$
Solving :$x^2 + bx + c \geq 0$
Solving :$x^2 + bx + c \leq 0$
Quadratic inequalities : Mixture

Indices 15

Evaluating - Positive Fractions

Indices *continued*

Evaluating- Negative Fractions
Multiplying $ax^n \times bx^m$
Dividing $\frac{ax^n y^m}{bx^p y^q}$
Brackets $(ax^n)^m$
Mixed Questions
Simplifying :$\frac{x^n \times x^m}{x^p}$
Simplifying : $\frac{ax^n \times bx^m}{cx^p}$
Simplifying : $x^{\frac{a}{b}} \div x^{\frac{c}{b}}$
Simplifying : $(nx^{\frac{a}{b}})^2 \div mx^{\frac{c}{b}}$
Simplifying : $x^{\frac{a}{b}} \div x^n$
Simplifying : $nx^{\frac{a}{b}} \div mx^c$
Simplify : $\frac{ax^n(bx^m+c)}{x^p}$
Simplify : $\frac{(bx^m+c)^2}{x^p}$
Indices : Mixture

Sequences 13

Generate sequences given an algebraic rule
Generate an increasing sequence - nth term
Generate a decreasing sequence - nth term
Generate a linear sequence - nth term
Generate a quadratic sequence - nth term
Find the nth term linear - inc
Find the nth term linear - dec
Find the nth term linear - mixture
Find the nth term quadratic
Find the 10th term - quadratic
Find the nth term mixture - lin/quad
Fractions sequences - nth term
Sequences : Mixture

03 LEVEL 2 FURTHER MATHS Functions and Graphs

6 topics
121 structures

Evaluating functions 17

Evaluating functions : $ax^2 - b$
Evaluating functions : $b - ax^2$
Evaluating functions : $(ax)^2 + b$
Evaluating functions : $\frac{ax^2}{b}$
Evaluating functions : $\frac{ax^2}{b} + c$
Evaluating functions : $\frac{ax^2}{b} - c$
Evaluating functions : $\sqrt{ax + b}$
Evaluating functions : $\sqrt{b - ax}$
Evaluating functions : $\sqrt{\frac{x+a}{b}}$
Evaluating functions : $x^2 + x$
Evaluating functions : $ax^2 \pm x$
Evaluating functions : $x^2 \pm ax$
Evaluating functions : $ax^2 \pm bx$
Evaluating functions : $ax - bx^2 \pm c$
Evaluating functions : $ax^3 \pm bx^2$
Evaluating functions : $ax^3 \pm bx^2 \pm cx \pm d$
Evaluating functions : Mixture

Finding the range 12

Find the range of $y = ax + b$
Find the range of $y = b - ax$
Find the range of $y = ax + b$
Find the range of $y = b - ax$
Find the range of $y = x^2$
Find the range of $y = x^2 \pm c$
Find the range of $y = a - x^2$
Find the range of $y = ax^2 \pm c$
Find the range of $y = b - ax^2$

Finding the range *continued*

Find the range of $y = ax^2 \pm bx$
Find the range of $y = bx - ax^2$
Finding the range : Mixture

Composite functions 11

$fg(x) f(x) = ax \pm b \;\; g(x) = cx \pm d$
$gf(x) \; f(x) = ax \pm b \;\; g(x) = cx \pm d$
$fg(x) \; f(x) = x^2 \;\; g(x) = ax \pm b$
$g(x) \; f(x) = x^2 \;\; g(x) = ax \pm b$
$fg(x) \; f(x) = ax^2 \;\; g(x) = bx \pm c$
$gf(x) \; f(x) = ax^2 \;\; g(x) = bx \pm c$
$fg(x) \; f(x) = x^2 \pm a \;\; g(x) = x \pm b$
$gf(x) \; f(x) = x^2 \pm a \;\; g(x) = x \pm b$
$fg(x) \; f(x) = a \pm bx \;\; g(x) = cx \pm d$
$gf(x) \; f(x) = a \pm bx \;\; g(x) = cx \pm d$
Composite functions : Mixture

Inverse Functions 44

Inverse functions : $x - a$
Inverse functions : $x + a$
Inverse functions : $a - x$
Inverse functions : ax
Inverse functions : $\frac{x}{a}$
Inverse functions : $\frac{a}{x}$
Inverse functions : $ax + b$
Inverse functions : $b - ax$
Inverse functions : $ax - b$
Inverse functions : $\frac{x+b}{a}$

Inverse Functions *continued*

- Inverse functions : $\frac{x-b}{a}$
- Inverse functions : $\frac{b-x}{a}$
- Inverse functions : $\frac{a}{x+b}$
- Inverse functions : $\frac{a}{x-b}$
- Inverse functions : $\frac{x}{a}+b$
- Inverse functions : $\frac{x}{a}-b$
- Inverse functions : $\sqrt{x}$
- Inverse functions : $a\sqrt{x}$
- Inverse functions : $\sqrt{x+a}$
- Inverse functions : $\sqrt{x-a}$
- Inverse functions : $\sqrt{a-x}$
- Inverse functions : $\frac{\sqrt{x}}{a}$
- Inverse functions : $\frac{a}{\sqrt{x}}$
- Inverse functions : $\sqrt{\frac{a}{x}}$
- Inverse functions : $\sqrt{\frac{x}{a}}$
- Inverse functions : $\sqrt{x}+a$
- Inverse functions : $\sqrt{x}-a$
- Inverse functions : $a-\sqrt{x}$
- Inverse functions : $a\sqrt{x+b}$
- Inverse functions : $a\sqrt{x-b}$
- Inverse functions : $a+\sqrt{x-b}$
- Inverse functions : $a-\sqrt{x-b}$
- Inverse functions : $a-\sqrt{x+b}$
- Inverse functions : $\frac{\sqrt{x+b}}{a}$
- Inverse functions : $\sqrt{\frac{x-b}{a}}$
- Inverse functions : $\sqrt{\frac{x+b}{a}}$
- Inverse functions : $\frac{\sqrt{x}}{a}+b$
- Inverse functions : $\frac{\sqrt{x}}{a}-b$
- Inverse functions : $b-\frac{\sqrt{x}}{a}$
- Inverse functions : $\sqrt{ax+b}$
- Inverse functions : $\sqrt{ax-b}$
- Inverse functions : $\sqrt{b-ax}$
- Inverse functions : $\frac{\sqrt{x}}{a}+b$
- Inverse Functions : Mixture

Sketching graphs 10

- Sketching $y=x^2\pm bx\pm c$

Sketching graphs *continued*

- Sketching $y=-x^2\pm bx\pm c$
- Sketching $y=ax^3\pm bx^2\pm cx\pm d$
- Sketching $y=-ax^3\pm bx^2\pm cx\pm d$
- Sketching graphs of exponential functions
- 3 function graphs
- 3 function graphs
- 3 function graphs
- 3 function graphs
- Sketching graphs : Mixture

Straight Line Graphs 27

- Determine which is the steeper line
- Identify the gradient (diagram)
- Find the gradient (2 points)
- Perpendicular gradient (2 points)
- Equation of a parallel line - through (0,a)
- Equation of a parallel line - through (0,a)
- Equation of a parallel line - through (a,b)
- Equation of a parallel line - through (a,b)
- Equation of a perpendicular line - through (0,a)
- Equation of a perpendicular line - through (0,a)
- Equation of a perpendicular line - through (a,b)
- Equation of a perpendicular line - through (a,b)
- Length of a line segment (1 d.p.)
- Length of a line segment (exact)
- Finding the midpoint
- Line ABC - finding coordinates - B
- Line ABC - finding coordinates - C
- Line ABC - finding coordinates - A
- Equation of a line - 2 function machines
- Equation of a line - through (a,b) and (0,c)
- Equation of a line - through (a,b) and (c,d)
- Equation of a line - gradient and y-intercept
- Identify the gradient of $y=mx\pm c$
- Identify the gradient after rearranging
- Diagram identify $y=mx\pm c$
- Diagram identify $y=-mx\pm c$
- Straight Line Graphs : Mixture

04 LEVEL 2 FURTHER MATHS Coordinate Geometry

1 topics
11 structures

Circles and tangents 11

- Finding the equation of a circle
- Equation of tangent to a circle
- Equation of tangent to a circle (centre not at origin)
- Equation of tangent to a circle (expanded form)
- Finding the equation of a circle centre and radius known
- Finding the equation of a circle diameter known

Circles and tangents *continued*

- Identifying the radius and centre
- Finding the centre and radius
- Finding the centre of a circle
- Finding the diameter of a circle
- Circles and tangents : Mixture

05 LEVEL 2 FURTHER MATHS Calculus

7 topics
84 structures

Differentiation 26

Finding the gradient function ax^n
Finding the gradient function : ax^{-n}
Finding the rate of change ax^n
Finding the rate of change : ax^{-n}
Differentiation : $y = mx \pm c$
Differentiation : $y = mx^2 \pm c$
Differentiation : $y = ax^2 \pm bx$
Differentiation : $y = ax^2 \pm bx \pm c$
Differentiation : $y = ax^3 \pm c$
Differentiation : $y = ax^3 \pm bx$
Differentiation : $y = ax^3 \pm bx \pm c$
Differentiation : $y = ax^3 \pm bx^2$
Differentiation : $y = ax^3 \pm bx^2 \pm d$
Differentiation : $y = ax^3 \pm bx^2 \pm cx$
Differentiation : $y = ax^3 \pm bx^2 \pm cx \pm d$
Differentiation : $y = ax^n \pm bx^m$
Differentiation : $y = (xpma)(x \pm b)$
Differentiation : $y = (ax \pm c)(bx \pm d)$
Differentiation : $y = ax^3 + bx^2 + cx + d$
Differentiation : $y = ax^4 + bx^3 + cx^2 + dx + e$
Differentiation : $y = ax(x + b)^2$
Differentiation : $y = ax^2(x + b)^2$
Differentiation : $y = (x + a)^2(x + b)^2$
Differentiation : $y = a(x + a)(x^2 + bx + c)$
Differentiation : $y = ax(x + a)(x^2 + bx + c)$
Differentiation : Mixture

Finding the gradient 11

Find the gradient : $y = ax^2 \pm c$
Find the gradient : $y = ax^2 \pm bx$
Find the gradient : $y = ax^2 \pm bx \pm c$
Find the gradient : $y = ax^3 \pm c$
Find the gradient : $y = ax^3 \pm bx$
Find the gradient : $y = ax^3 \pm bx \pm c$
Find the gradient : $y = ax^3 \pm bx^2$
Find the gradient : $y = ax^3 \pm bx^2 \pm c$
Find the gradient : $y = ax^3 \pm bx^2 \pm cx$
Find the gradient : $y = ax^3 \pm bx^2 \pm cx \pm d$
Finding the gradient : Mixture

Equation of a tangent 11

Equation of the tangent : $y = ax^2 \pm c$
Equation of the tangent : $y = ax^2 \pm bx$
Equation of the tangent : $y = ax^2 \pm bx \pm c$
Equation of the tangent : $y = ax^3 \pm c$
Equation of the tangent : $y = ax^3 \pm bx$
Equation of the tangent : $y = ax^3 \pm bx \pm c$
Equation of the tangent : $y = ax^3 \pm bx^2$

Equation of a tangent *continued*

Equation of the tangent : $y = ax^3 \pm bx^2 \pm c$
Equation of the tangent : $y = ax^3 \pm bx^2 \pm cx$
Equation of the tangent : $y = ax^3 \pm bx^2 \pm cx \pm d$
Equation of a tangent : Mixture

Equation of a normal 11

Equation of the normal : $y = ax^2 \pm c$
Equation of the normal : $y = ax^2 \pm bx$
Equation of the normal : $y = ax^2 \pm bx \pm c$
Equation of the normal : $y = ax^3 \pm c$
Equation of the normal : $y = ax^3 \pm bx$
Equation of the normal : $y = ax^3 \pm bx \pm c$
Equation of the normal : $y = ax^3 \pm bx^2$
Equation of the normal : $y = ax^3 \pm bx^2 \pm c$
Equation of the normal : $y = ax^3 \pm bx^2 \pm cx$
Equation of the normal : $y = ax^3 \pm bx^2 \pm cx \pm d$
Equation of a normal : Mixture

Increasing and decreasing functions 13

Increasing functions $y = ax^2 + bx$
Decreasing functions $y = ax^2 + bx$
Increasing functions $y = ax^2 + bx + c$
Decreasing functions $y = ax^2 + bx + c$
Increasing functions $y = ax^3 + bx^2$
Decreasing functions $y = ax^3 + bx^2$
Increasing functions $y = ax^3 + bx^2 + c$
Decreasing functions $y = ax^3 + bx^2 + c$
Increasing functions $y = ax^3 + bx^2 + cx$
Decreasing functions $y = ax^3 + bx^2 + cx$
Increasing functions $y = ax^3 + bx^2 + cx + d$
Decreasing functions $y = ax^3 + bx^2 + cx + d$
Inc & dec functions : Mixture

Second derivative 8

Finding $\frac{d^2y}{dx^2}$: $y = ax^3 + bx^2 + cx + d$
Finding $\frac{d^2y}{dx^2}$: $y = ax^4 + bx^3 + cx^2 + dx + e$
Finding $\frac{d^2y}{dx^2}$: $y = ax(x + b)^2$
Finding $\frac{d^2y}{dx^2}$: $y = ax^2(x + b)^2$
Finding $\frac{d^2y}{dx^2}$: $y = (x + a)^2(x + b)^2$
Finding $\frac{d^2y}{dx^2}$: $y = a(x + a)(x^2 + bx + c)$
Finding $\frac{d^2y}{dx^2}$: $y = ax(x + a)(x^2 + bx + c)$
Second derivative : Mixture

Stationary points 4

Find the stationary points : $y = x^3 + bx^2 + c + d$
Stationary points and sketch : $y = x^3 + bx^2 + c + d$
Stationary points and sketch : $y = x^3 + bx^2 + c + d$
Stationary points : Mixture

06 LEVEL 2 FURTHER MATHS Matrices

2 topics
17 structures

Calculations 10

- Multiplication by a scalar
- Multiplication $2 \times 2 \quad \times \quad 2 \times 1$
- Multiplication missing values
- Multiplication missing values
- Multiplication missing values
- Multiplication $2 \times 2 \quad \times \quad 2 \times 2$
- Multiplication missing values
- Multiplication missing values
- Multiplication missing values
- Calculations - Matrices : Mixture

Transformations 7

- Image of a point
- Missing values
- Stating the matrix
- Describing the transformation
- Finding the combined matrix
- Finding the coordinates of the image
- Transformations Matricies : Mixture

07 LEVEL 2 FURTHER MATHS Geometry

7 topics
86 structures

Angles Recap 22

- Angles on a straight line
- Angles on a straight line
- Angles at a point
- Angles at a point
- Vertically Opposite Angles
- Angles in a triangle
- Angles in an isosceles triangle
- Angles in an isosceles triangle
- Angles in a right angled triangle
- Calculate missing angles triangles
- Corresponding angles
- Allied/co-interior angles
- Alternate angles
- Basic Mixture (1-3)
- Parallel lines
- Parallel lines
- Parallel lines
- Parallel lines
- Calculate angles in a quadrilateral
- Interior angles - polygons
- Exterior angles - polygons
- Angles Recap : Mixture

Trigonometry · Trigonometry – 2D 27

- Sine ratio - calculating sides (mix)
- Sine ratio - calculating the angle (mix)
- Cosine ratio - calculating sides (mix)
- Cosine ratio - calculating the angle (mix)
- Tangent ratio - calculating sides (mix)
- Tangent ratio - calculating the angle (mix)
- Ladder problems
- Angle of depression
- Angle of elevation
- Angle in a rectangle
- Sine rule - calculating an angle
- Sine rule - calculating an angle
- Sine rule - calculating an angle (mix)
- Sine rule - calculating sides
- Sine rule - calculating sides
- Sine rule - calculating sides (mix)
- Sine rule - calculating angles and sides
- Calculating the area
- Calculating the area

Trigonometry · Trigonometry – 2D *continued*

- Calculating the area (1 & 2)
- Calculating an angle
- Calculating a side
- Side and angle mixture
- Cosine rule - calculating an angle
- Cosine rule - calculating sides
- Cosine rule - calculating angles and sides
- Trigonometry - 2D : Mixture

Pythagoras' Theorem 9

- Pythagoras - mixed sides
- Height - equilateral triangle
- Slant height - isosceles triangle
- Height - isosceles triangle
- Perimeter - isosceles triangle
- Area - isosceles triangle
- Length of a diagonal
- Distance between 2 points
- Pythagoras' Theorem : Mixture

Trigonometry · Trigonometry – 3D 4

- Trigonometry in 3D - Cuboid Problems
- Trigonometry in 3D - Pyramid Problems
- Trigonometry in 3D - mixed Problems
- Trigonometry - 3D : Mixture

Graphs of Trig functions 4

- Using the sine graph
- Using the cosine graph
- Sine and cosine graph
- Graphs -Trig functions : Mixture

Solving Trig Equations 13

- Solve $acos^2\theta \pm bsin\theta \pm c = 0 \ \ (0^o \leq \theta \leq 360^o)$
- Solve $asin^2\theta \pm bcos\theta \pm c = 0 \ \ (0^o \leq \theta \leq 360^o)$
- Solve $acos^2\theta = bsin\theta \pm c \ \ (0^o \leq \theta \leq 360^o)$
- Solve $asin^2\theta = bcos\theta \pm c \ \ (0^o \leq \theta \leq 360^o)$
- Solve $asin^2\theta \pm bsin\theta \pm c = dcos^2\theta \ \ (0^o \leq \theta \leq 360^o)$
- Solve $acos^2\theta \pm bcos\theta \pm c = dsin^2\theta \ \ (0^o \leq \theta \leq 180^o)$
- Solve $acos^2\theta \pm bsin\theta - c = 0 \ (0^o \leq \theta \leq 180^o)$
- Solve $asin^2\theta \pm bcos\theta - c = 0 \ (0^o \leq \theta \leq 180^o)$
- Solve $acos^2\theta = \pm bsin\theta \pm c \ (0^o \leq \theta \leq 180^o)$

Solving Trig Equations

continued

Solve $asin^2\theta = \pm bcos\theta \pm c$ $(0^o \leq \theta \leq 180^o)$
Solve $asin^2\theta \pm bsin\theta \pm c = dcos^2\theta$ $(0^o \leq \theta \leq 180^o)$
Solve $acos^2\theta \pm bcos\theta \pm c = dsin^2\theta$ $(0^o \leq \theta \leq 180^o)$
Solving Trig Equations : Mixture

Using Trig Identities

7

In terms of $\sin\theta$: $\mathrm{a}\cos^2\theta \pm b\sin\theta \pm c$
In terms of $\cos\theta$: $\mathrm{a}\sin^2\theta \pm b\cos\theta \pm c$
In terms of $\sin\theta$: $\mathrm{a}\sin^2\theta \pm b\cos^2\theta \pm c\cos\theta + d$
In terms of $\sin\theta$: $\mathrm{a}\sin^2\theta \pm b\cos^2\theta \pm c\cos\theta + d$
In terms of $\sin\theta$: $\cos\theta(\mathrm{a}\cos\theta \pm b\tan\theta)$
In terms of $\sin\theta$: $\mathrm{a}\tan\theta \pm b\cos^3\theta$
Using Trig Identities : Mixture