



Ark Acton
Academy

**What are we
learning in
Yr12 Maths?**

Spring 2022

What are students studying this term?	Where can your child find resources to use for support or practice?
P1: Ch8 The Binomial expansion	<p>Objectives</p> <p>After completing this chapter you should be able to:</p> <ul style="list-style-type: none"> ● Use Pascal's triangle to identify binomial coefficients and use them to expand simple binomial expressions → pages 159–161 ● Use combinations and factorial notation → pages 161–163 ● Use the binomial expansion to expand brackets → pages 163–165 ● Find individual coefficients in a binomial expansion → pages 165–167 ● Make approximations using the binomial expansion → pages 167–169
P1: Ch9 Trigonometric Ratio	<p>Objectives</p> <p>After completing this unit you should be able to:</p> <ul style="list-style-type: none"> ● Use the cosine rule to find a missing side or angle → pages 174–179 ● Use the sine rule to find a missing side or angle → pages 179–185 ● Find the area of a triangle using an appropriate formula → pages 185–187 ● Solve problems involving triangles → pages 187–192 ● Sketch the graphs of the sine, cosine and tangent functions → pages 192–194 ● Sketch simple transformations of these graphs → pages 194–198
P1: Ch10 Trigonometric Identities & equations	<p>Objectives</p> <p>After completing this chapter you should be able to:</p> <ul style="list-style-type: none"> ● Calculate the sine, cosine and tangent of any angle → pages 203–208 ● Know the exact trigonometric ratios for 30°, 45° and 60° → pages 208–209 ● Know and use the relationships $\tan \theta \equiv \frac{\sin \theta}{\cos \theta}$ and $\sin^2 \theta + \cos^2 \theta \equiv 1$ → pages 209–213 ● Solve simple trigonometric equations of the forms $\sin \theta = k$, $\cos \theta = k$ and $\tan \theta = k$ → pages 213–217 ● Solve more complicated trigonometric equations of the forms $\sin n\theta = k$ and $\sin(\theta \pm \alpha) = k$ and equivalent equations involving \cos and \tan → pages 217–219 ● Solve trigonometric equations that produce quadratics → pages 219–222

P1: Ch11
Vectors

Objectives

After completing this chapter you should be able to:

- Use vectors in two dimensions → pages 231–235
- Use column vectors and carry out arithmetic operations on vectors → pages 235–238
- Calculate the magnitude and direction of a vector → pages 239–242
- Understand and use position vectors → pages 242–244
- Use vectors to solve geometric problems → pages 244–247
- Understand vector magnitude and use vectors in speed and distance calculations → pages 248–251
- Use vectors to solve problems in context → pages 248–251

P1: Ch12
Differentiation

Objectives

After completing this chapter you should be able to:

- Find the derivative, $f'(x)$ or $\frac{dy}{dx}$, of a simple function → pages 259–268
- Use the derivative to solve problems involving gradients, tangents and normals → pages 268–270
- Identify increasing and decreasing functions → pages 270–271
- Find the second order derivative, $f''(x)$ or $\frac{d^2y}{dx^2}$, of a simple function → pages 271–272
- Find stationary points of functions and determine their nature → pages 273–276
- Sketch the gradient function of a given function → pages 277–278
- Model real-life situations with differentiation → pages 279–281

P1: Ch13
Integration

Objectives

After completing this unit you should be able to:

- Find y given $\frac{dy}{dx}$ for x^n → pages 288–290
- Integrate polynomials → pages 290–293
- Find $f(x)$, given $f'(x)$ and a point on the curve → pages 293–295
- Evaluate a definite integral → pages 295–297
- Find the area bounded by a curve and the x -axis → pages 297–302
- Find areas bounded by curves and straight lines → pages 302–306

P1: Ch14
Exponentials &
Logarithms

Objectives

After completing this unit you should be able to:

- Sketch graphs of the form $y = a^x$, $y = e^x$, and transformations of these graphs → pages 312–317
- Differentiate e^{kx} and understand why this result is important → pages 314–317
- Use and interpret models that use exponential functions → pages 317–319
- Recognise the relationship between exponents and logarithms → pages 319–321
- Recall and apply the laws of logarithms → pages 321–324
- Solve equations of the form $a^x = b$ → pages 324–325
- Describe and use the natural logarithm function → pages 326–328
- Use logarithms to estimate the values of constants in non-linear models → pages 328–333

M1: Ch11
Variable
acceleration

Objectives

After completing this chapter you should be able to:

- Understand that displacement, velocity and acceleration may be given as functions of time → pages 182–184
- Use differentiation to solve kinematics problems → pages 185–186
- Use calculus to solve problems involving maxima and minima → pages 186–188
- Use integration to solve kinematics problems → pages 188–191
- Use calculus to derive constant acceleration formulae → pages 191–193