Grade 11 Mid-Term February Revision

10 Questions - 45 Marks - 45 Minutes

Topics:

- Handling Data 3

- Number 9

- Algebra 9

- Graphs 8

- Shape and Space 9

Pages 247 - 332 - Edexcel Mathematics Student Book 2

HANDLING DATA 5
EDEXCEL INTERNATIONAL GCSE (9-1)
STUDENT BOOK 2 pages 247 - 262

Learning Objectives	Basic Principles	Key points
1. Add probabilities for mutually exclusive events 2. Find the probability of independent events 3. Draw and use tree diagrams to calculate the probability of independent events. 4. Decide whether two events are independent or dependent 5. Draw and use tree diagrams to calculate conditional probability 6. Use two-way tables to calculate conditional probability	1. For equally likely outcomes, probability = number of successful outcomes / total number of possible outcomes 2. P(A) means the probability of event A occurring. 3. P(A') means the probability of event A not occurring. 4. $0 \leq P(A) \leq 1$ 5. P(A) + P(A') = 1, so P(A') = 1 − P(A) 6. P(A|B) means the probability of A occurring given that B has already happened.	1. For two independent events A and B, P(A and B) = P(A) x P(B) 2. For mutually exclusive events A and B, P(A or B) = P(A) + P(B)
Vocabulary: independent events, mutually exclusive, face, tree diagram, conditional probability, dependent		

Unit 9

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NUMBER 9
EDEXCEL INTERNATIONAL GCSE (9-1)
STUDENT BOOK 2 pages 265 - 274

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<td>**Learning Objectives**</td>
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1. Decide which product or services is better value for money

2. Carry out calculations involving money

3. Solve real-life problems involving percentages and money

4. Convert between currencies

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1. Global financial processes can be complex. The ones in this section involve the simple day-to-day concepts of comparative costs, salaries and taxes, sales tax and foreign currency.

2. The mathematical processes involved in this section have all been met before.

3. The key skills all involve percentages.

4. To calculate *x* **as a percentage of** *y: x/y x 100*

5. To calculate *x* per cent of *y*: 1% of *y* = y / 100 so *x*% of *y* = x x y/100 = y (x/100)

6. 5% of a quantity can be found by multiplying by 5/100 or 0.05

7. 95% of a quantity can be found by multiplying by 95/100 or 0.95

8. 1%=1/100=0.01 and so on.

9. Percentage change = (value of change / original value) x 100

10. Per annum (p.a.) is frequently used and means 'per year'.

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-To increase a quantity by R%, multiply it by 1 + R/100

-To decrease a quantity by R%, multiply it by 1 - R/100

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Vocabulary: Percentage, Increase, Decrease, Comparative, Taxation, Sales, Sales Tax, Salaries, Income Tax, Foreign Currency
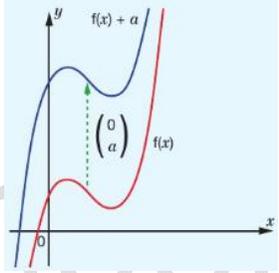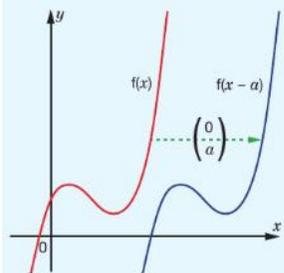
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ALGEBRA 9
EDEXCEL INTERNATIONAL GCSE (9-1)
STUDENT BOOK 2 pages 276 - 290

Learning Objectives	Basic Principles	Key points
1. Solve simultaneous equations with one equation being quadratic 2. Solve simultaneous equation being a circle 3. Prove a result using algebra	1. Solve quadratic equations (using factorization or the quadratic formula). 2. Solve simultaneous equations (by substitution, elimination or graphically). 3. Expand brackets. 4. Expand the product of two linear expressions. 5. Form and simplify expressions. 6. Factorise expressions. 7. Complete the square for a quadratic expression.	1. When solving simultaneous equations where one equation is linear and the other is non-linear: a. If there is one solution, the line is a tangent to the curve b. If there is no solution, the line does not intersect the curve. 2. If the two equations are of the form $y = f(x)$ and $y = g(x)$: a. Solve the equation $f(x) = g(x)$ to find x. b. When x has been found, find y using the easier of the original equations. c. Write out your solutions in the correct pairs. 3. When n is an integer, consecutive integers can be written in the form…, $n - 1, n, n + 1, n + 2, …$ 4. When n is an integer a. Any even number can be written in the form $2n$. b. Consecutive even numbers can be written in the form $2n, 2n + 2, 2n + 4, …$ c. Any odd number can be written in the form $2n + 1$ d. Consecutive odd numbers can be written in the form $2n + 1, 2n + 3, 2n + 5, …$ 5. $(x - a)^2 \geq 0$ and $(x + a)^2 \geq 0$ for all x. 6. $(x - a)^2 = 0$ when $x = a$ and $(x + a)^2 = 0$ when $x = -a$ 7. To prove a quadratic function is greater or less than zero, write it in completed square form. 8. To find the co-ordinates of the turning point of a quadratic graph, write it in complete square form $y = a(x+b)^2 + c$. The turning point is then $(-b, c)$.

Vocabulary: quadratic equation, factorization, expand, cross section, counter-example, consecutive, perfect square, minimum point, maximum point, turning point, quadratic graph, parabola, arc

GRAPHS 8
EDEXCEL INTERNATIONAL GCSE (9-1)
STUDENT BOOK 2 pages 293 - 293-321

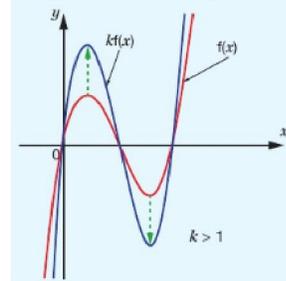| Learning Objectives	Basic Principles	Key points
1. Find the gradient of a tangent at a point. 2. Translate the graph of a function 3. Understand the relationship between translating a graph and the change in its function form 4. Reflect the graph of a function 5. Understand the effect reflecting a curve in one of the axes has on its function form. 6. Stretch the graph pf a function 7. Understand the effect stretching a curve parallel to one of the axes has on its function form	1. Remember that a tangent is a straight line that touches a curve at one point only. 2. Find the gradient of a line through two points. 3. Find the gradient of a straight line graph. 4. Plot the graphs of linear and quadratic functions using a table of values. 5. Interpret distance-time graphs. 6. Interpret speed-time graphs. 7. Identify transformations. 8. Translate a shape using a vector and describe a translation using a column vector. 9. Reflect a shape in the *x*- and *y*-axes and describe a reflection. 10. Identify the image of a point after a reflection in the *x*-axis	1. To estimate the gradient of a curve at a point a. Draw the best estimate of the tangent at the point b. Find the gradient of this tangent 2. Be careful finding the rise and run when the scales on the axes are different. 3. The graph of $y = f(x) + a$ is a translation of the graph of $y = f(x)$ by $\begin{pmatrix} 0 \\ a \end{pmatrix}$ 4. The graph of $y = f(x - a)$ is a translation of the graph of $y = f(x)$ by $\begin{pmatrix} a \\ 0 \end{pmatrix}$ 5. The graph of $y = f(x + a)$ is a translation of the graph of $y = f(x)$ by $\begin{pmatrix} -a \\ 0 \end{pmatrix}$ 6. Be very careful with signs, they are opposite to what most people expect. 7. The graph of $y = -f(x)$ is a reflection of the graph of $y = f(x)$ in the *x*-axis. 8. The graph of $y = f(-x)$ is a reflection of the graph of y

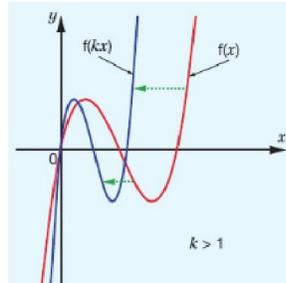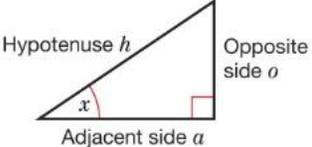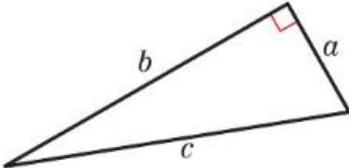|		
	or a reflection in the *y*-axis.	= f(*x*) in the *y*-axis.
	11. Use function notation.	9. The graph of *y* = *k*f(*x*) is a stretch of the graph *y* = f(*x*) with a scale factor of *k* parallel to the *y*-axis (all *y*-co-ordinates are multiplied by *k*). a. If *k*> 1 the graph is stretched by *k*. b. If 0 <*k*< 1 the graph is compressed by *k* 10. The graph of *y* = f(*kx*) is a stretch of the graph *y* = f(*x*) with a scale factor of 1/*k* parallel to the *x*-axis (all the *x*-co-ordinates are multiplied by 1/*k*). a. If *k*> 1 the graph is compressed by 1/*k* b. If 0 <*k*< 1 the graph is stretched by 1/*k*
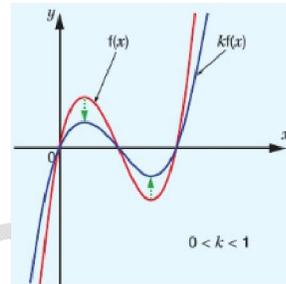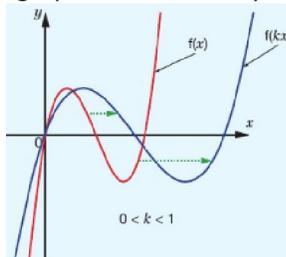
Vocabulary: translation, vector, column vector, scales, velocity, maximum point, minimum point, degree mode (calculator)

SPACE AND SHAPE 9
EDEXCEL INTERNATIONAL GCSE (9-1)
STUDENT BOOK 2 pages 293-321

Learning Objectives	Basic Principles	Key points
1. Use Pythagoras' Theorem in 3D 2. Use trigonometric in 3D to solve problems	1. Trig ratios: tan x = opp/adj sin x = opp / hyp cos x = adj / hyp 2. Identify the hypotenuse. This is the longest side: the side opposite the right angle. Then the opposite side is the side opposite the angle. And the adjacent side is adjacent to (next to) the angle. Hypotenuse h Opposite side o x Adjacent side a -Pythagoras' Theorem: b a c	1. When solving problems in 3D: a. Draw clear, large diagrams including all the facts. b. Redraw the appropriate triangle (usually right-angled) including all the facts. This simplifies a 3D problem into a 2D problem using Pythagoras' Theorem and trigonometry to solve for angles and lengths. c. Use all the decimal places shown on your calculator at each stage in your working to avoid errors in your final answer caused by rounding too soon.

Vocabulary: hypotenuse, right angle, adjacent, plane, perpendicular, intersect, vertex, face, cross-section, prism, angle of elevation, hemispherical, bearing