GCSE MATHEMATICS (9-1) — EXAM PRACTICE WORKBOOK

Grade 9 Mathematics — Practice Questions

(Higher Tier)

Higher Tier Exam Practice, Calculator Tags, 2 Mixed Review Papers & Full Answer Key

- **6 Edexcel Higher Exam-Style Questions** per topic with mark allocations
- **Calculator & Non-Calculator Badges** on every single question
- **2 Interleaved Mixed Review Sets** (Paper 1 & Paper 2/3 method selection)
- **Structured Working Spaces** & Topic-Linked Answer Key Appendix

Student Name: _____

Class / Teacher: _____

Target Grade: _____

SCAN FOR ONLINE PRACTICE & WORKED SOLUTIONS

BreakingDownMaths.com

Interactive Step-by-Step GCSE Mathematics Mastery

Table of Contents

Click any topic to jump straight there. Complete both Mixed Review Sets before checking the Answer Key Appendix.

ALGEBRA

Algebraic Proof Page 3

Equation of a Circle Page 5

RATIO, PROPORTION AND RATES OF CHANGE

Gradients & Rates of Change Page 7

GEOMETRY AND MEASURES

Vector Proofs Page 11

PROBABILITY

Probability Equations Page 14

MIXED EXAM REVIEW (PICK THE RIGHT METHOD)

Mixed Review 1 (Non-Calculator) Page 17

Mixed Review 2 (Calculator) Page 23

Appendix (Answers) Page 30

ALGEBRA — ALGEBRAIC PROOF

Algebraic Proof

EDEXCEL GCSE EXAM PRACTICE

Algebraic Proof — Practice Questions

Total: 19 marks

Check the Calculator or Non-Calculator label on each question before you start. Show your working clearly in the box.

Question 1 Non-Calculator **(3 marks)**

Prove algebraically that the sum of the squares of any two consecutive even integers is always a multiple of 4.

WORKING & PROOF SPACE

Question 2 Non-Calculator **(3 marks)**

Prove algebraically that the difference between the squares of any two consecutive odd integers is always a multiple of 8.

WORKING & PROOF SPACE

Question 3 Non-Calculator **(3 marks)**

Prove algebraically that the sum of the squares of any two consecutive integers is always an odd number.

WORKING & PROOF SPACE

Question 4 Non-Calculator **(3 marks)**

Prove algebraically that $(5n+3)^2-(5n-3)^2$ is always a multiple of 60 for all positive integer values of n.

WORKING & PROOF SPACE

Question 5 Non-Calculator **(3 marks)**

Prove algebraically that $(n+5)(n-1)+9$ is always a square number for all integer values of n.

WORKING & PROOF SPACE

Question 6 Non-Calculator **(4 marks)**

Prove algebraically that the square of any odd integer is always 1 more than a multiple of 8.

WORKING & PROOF SPACE

ALGEBRA — COORDINATE GEOMETRY

Equation of a Circle

EDEXCEL GCSE EXAM PRACTICE

Equation of a Circle — Practice Questions

Total: 17 marks

Check the Calculator or Non-Calculator label on each question before you start. Show your working clearly in the box.

Question 1 Non-Calculator **(1 mark)**

A circle has the equation $x^2 + y^2 = 225$.
Find the radius of the circle.

WORKING OUT SPACE

Answer: .....

Question 2 Calculator **(2 marks)**

A circle has the equation $x^2 + y^2 = 289$.
Prove that the point $(-8, 15)$ lies on the circle.

WORKING & PROOF SPACE

Question 3 Non-Calculator **(2 marks)**

A circle has the equation $x^2 + y^2 = 225$.
Calculate the exact area of the circle in terms of π.

WORKING OUT SPACE

Answer: .....

Question 4 Non-Calculator (3 marks)

The point $P(4, k)$, where $k > 0$, lies on the circle with equation $x^2 + y^2 = 52$.

(a) Find the value of k.
(b) Work out the gradient of the radius OP.

WORKING OUT SPACE

(a) $k =$ ..... **(b) Gradient** $=$ .....

Question 5 Calculator (4 marks)

A circle has the equation $x^2 + y^2 = 289$.
Find the equation of the tangent to the circle at the point $(8, 15)$.

WORKING OUT SPACE

Answer: .....

Question 6 Calculator (5 marks)

A circle has the equation $x^2 + y^2 = 169$.
The tangent to the circle at the point $(5, 12)$ meets the y-axis at the point A and the x-axis at the point B.

(a) Find the equation of the tangent in the form $y = mx + c$.
(b) Work out the exact area of triangle OAB, where O is the origin.

WORKING OUT SPACE

(a) ..... **(b) Area** $=$ .....

RATIO, PROPORTION AND RATES OF CHANGE — RATES OF CHANGE

Gradients & Rates of Change

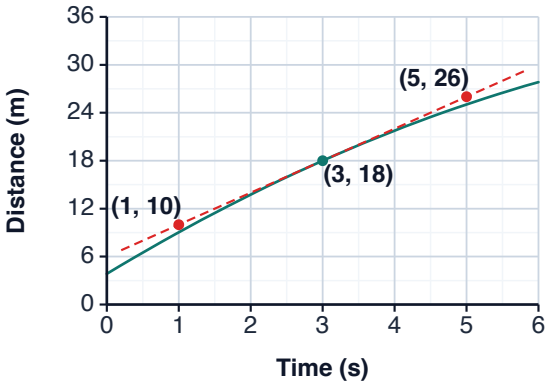
EDEXCEL GCSE EXAM PRACTICE

Gradients & Rates of Change — Practice Questions

Total: 16 marks

Check the Calculator or Non-Calculator label on each question before you start. Show your working clearly in the box.

Question 1 Non-Calculator **(2 marks)**



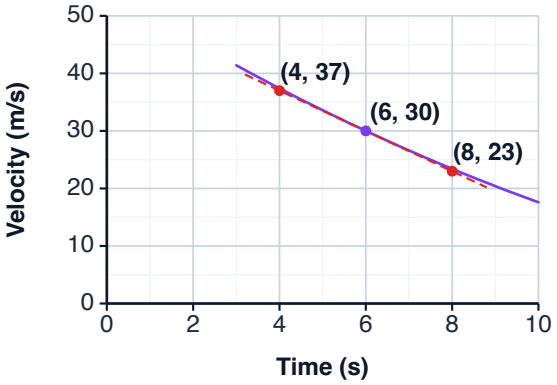
The curved distance-time graph shows the distance travelled by a cyclist. A tangent to the curve has been drawn at $t = 3$ s, passing through $(1, 10)$ and $(5, 26)$.

Work out the **instantaneous speed** of the cyclist at $t = 3$ s in m/s.

WORKING OUT SPACE

Answer: .....

Question 2 Calculator (2 marks)



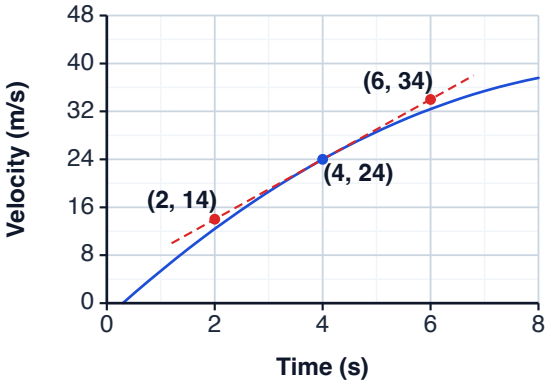
The velocity-time graph shows a vehicle slowing down. A tangent to the curve is drawn at $t = 6$ s, passing through $(4, 37)$ and $(8, 23)$.

Calculate the **rate of deceleration** (as a positive value) at $t = 6$ s in $\mathrm{m/s^2}$.

WORKING OUT SPACE

Answer: .....

Question 3 Non-Calculator (2 marks)



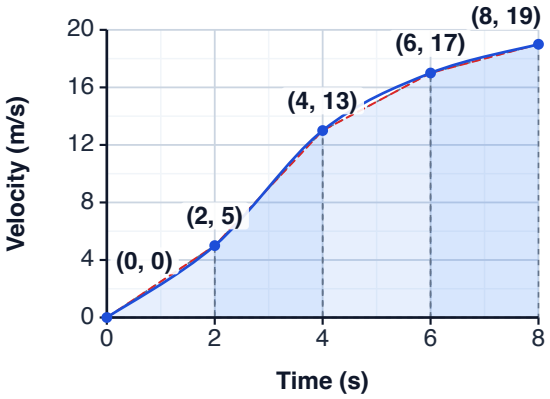
The curved velocity-time graph shows the motion of a car. A tangent to the curve has been drawn at $t = 4$ s, passing through $(2, 14)$ and $(6, 34)$.

Calculate the **instantaneous acceleration** of the car at $t = 4$ s in $\mathrm{m/s^2}$.

WORKING OUT SPACE

Answer: .....

Question 4 Calculator (3 marks)



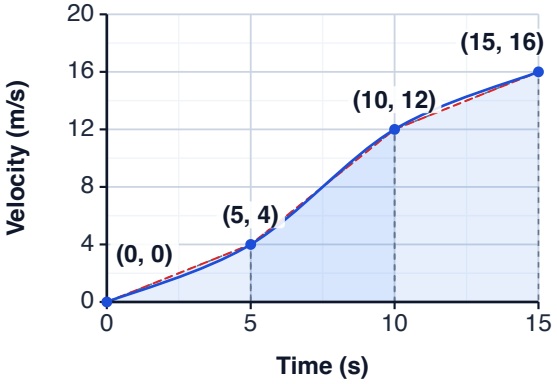
The velocity-time graph shows the motion of an object over 8 seconds. The area under the curve has been divided into **4 strips of equal width** ($h = 2$ s).

Use the **trapezium rule** to work out an estimate for the total distance travelled in the 8 seconds in metres.

WORKING OUT SPACE

Answer: .....

Question 5 Calculator (3 marks)



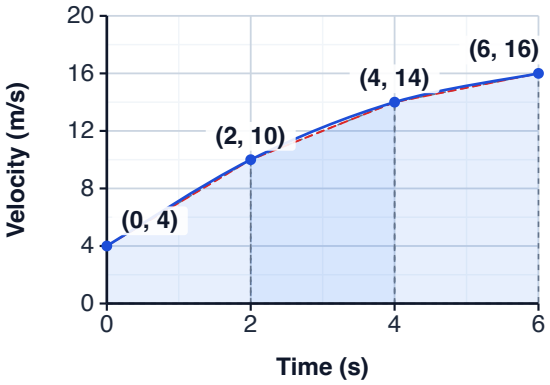
The velocity-time graph shows the motion of a train over 15 seconds. The area under the curve has been divided into **3 strips of equal width** ($h = 5$ s).

Use the **trapezium rule** to work out an estimate for the **average speed** of the train over the 15 seconds in $\mathrm{m/s}$.

WORKING OUT SPACE

Answer: .....

Question 6 Non-Calculator **(4 marks)**



The velocity-time graph shows a speedboat accelerating from an initial velocity of $4\ \text{m/s}$ over 6 seconds. The area under the curve has been divided into **3 trapezium strips of equal width** ($h = 2$ s).

(a) Work out an estimate for the distance travelled by the speedboat in the 6 seconds in metres.
(b) State whether your answer to part (a) is an underestimate or an overestimate of the actual distance travelled. Give a reason for your answer.

WORKING OUT SPACE

(a) ..... m

(b) ..... **Reason:** .....

GEOMETRY AND MEASURES — TRANSFORMATIONS & VECTORS

Vector Proofs

EDEXCEL GCSE EXAM PRACTICE

Vector Proofs — Practice Questions

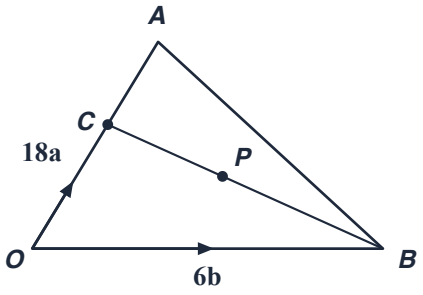
Total: 26 marks

Check the Calculator or Non-Calculator label on each question before you start. Show your working clearly in the box.

Question 1 Non-Calculator **(4 marks)**

In the diagram, OAB is a triangle with $\vec{OA} = 18\mathbf{a}$ and $\vec{OB} = 6\mathbf{b}$.
C is the midpoint of OA, and P is the point on CB such that $CP : PB = 1 : 2$.

Find $\vec{OP}$ in terms of $\mathbf{a}$ and $\mathbf{b}$ in its simplest form.



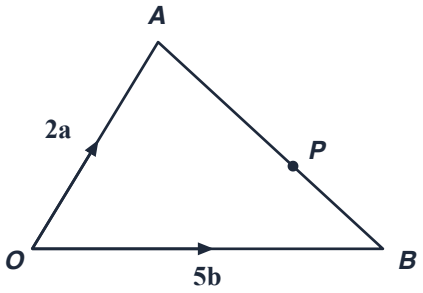
WORKING OUT SPACE

Answer: .....

Question 2 Non-Calculator **(4 marks)**

In the diagram, OAB is a triangle with $\vec{OA} = 2\mathbf{a}$ and $\vec{OB} = 5\mathbf{b}$.
P is the point on AB such that $AP : PB = 3 : 2$.

Given that $\vec{OP} = k(4\mathbf{a} + 15\mathbf{b})$, find the value of k.

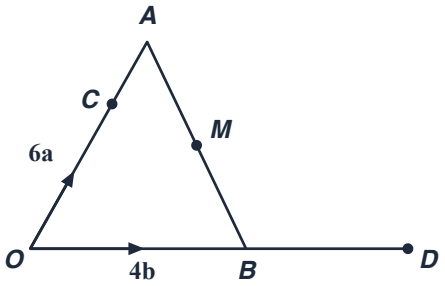


WORKING OUT SPACE

$k =$ .....

Question 3 Non-Calculator **(5 marks)**

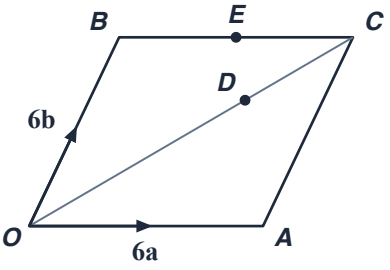
In the diagram, OAB is a triangle with $\vec{OA} = 6\mathbf{a}$ and $\vec{OB} = 4\mathbf{b}$.
C is the point on OA such that $OC : CA = 2 : 1$.
M is the midpoint of AB.
D is the point on OB extended such that $OB : BD = 1 : 1$.
Prove that C, M, and D lie on a straight line.



WORKING & PROOF SPACE

Question 4 Non-Calculator **(4 marks)**

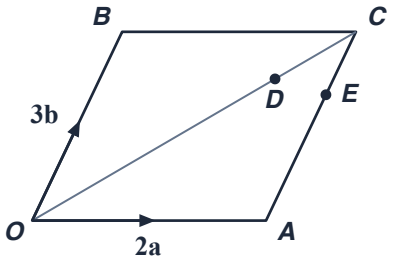
The diagram shows a parallelogram $OACB$ with $\vec{OA} = 6\mathbf{a}$ and $\vec{OB} = 6\mathbf{b}$.
D is the point on OC such that $OD : DC = 2 : 1$.
E is the midpoint of BC.
Prove that A, D, and E lie on a straight line.



WORKING & PROOF SPACE

Question 5 Non-Calculator (4 marks)

The diagram shows a parallelogram $OACB$ with $\vec{OA} = 2\mathbf{a}$ and $\vec{OB} = 3\mathbf{b}$.
D is the point on OC such that $OD : DC = 3 : 1$.
E is a point on AC such that B, D, and E lie on a straight line.
Find the ratio $AE : EC$ in its simplest form.

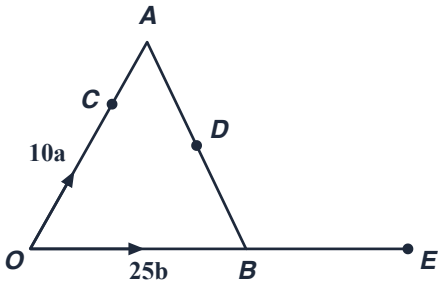


WORKING OUT SPACE

Answer: .....

Question 6 Calculator (5 marks)

In the diagram, OAB is a triangle with $\vec{OA} = 10\mathbf{a}$ and $\vec{OB} = 25\mathbf{b}$.
C is the point on OA such that $OC : CA = 1 : 1$.
D is the point on AB such that $AD : DB = 3 : 2$.
The line OB is extended to a point E such that C, D, and E lie on a straight line.
Find the vector $\vec{BE}$ in terms of $\mathbf{b}$.



WORKING OUT SPACE

Answer: .....

PROBABILITY — ALGEBRAIC PROBABILITY

Probability Equations

EDEXCEL GCSE EXAM PRACTICE

Probability Equations — Practice Questions

Total: 19 marks

Check the Calculator or Non-Calculator label on each question before you start. Show your working clearly in the box.

Question 1 Non-Calculator **(3 marks)**

There are only red counters and yellow counters in a bag in the ratio $2 : 3$.

Two counters are taken at random from the bag without replacement.

The probability that both counters are red is $\frac{2}{15}$.

Work out the total number of counters in the bag before any were removed.

WORKING OUT SPACE

Answer: .....

Question 2 Calculator **(4 marks)**

There are only blue counters, green counters and white counters in a bag.
There are 3 times as many blue counters as green counters.
There are 4 white counters.

Two counters are taken at random from the bag without replacement.

The probability that both counters are green is $\frac{1}{40}$.

Work out the number of **blue** counters in the bag.

WORKING OUT SPACE

Answer: .....

Question 3 Non-Calculator (3 marks)

A bag contains 6 green counters and y white counters.

A counter is taken at random from the bag, its colour is noted, and it is **replaced** in the bag.
A second counter is then taken at random.

The probability that the first counter is green and the second counter is white is $\frac{2}{9}$.

Given that $y > 6$, work out the value of y.

WORKING OUT SPACE

Answer: .....

Question 4 Non-Calculator (3 marks)

A bag contains x green marbles and $(x + 3)$ purple marbles.

Two marbles are taken at random from the bag without replacement.

The probability that both marbles are green is $\frac{5}{39}$.

Work out the value of x.

WORKING OUT SPACE

Answer: .....

Question 5 Calculator (3 marks)

There are n counters in a bag.
6 of the counters are red and the rest are blue.

Two counters are taken at random from the bag without replacement.
The probability that both counters are the **same colour** is $\frac{1}{2}$.

Given that more than half of the counters in the bag are blue, work out the value of n.

WORKING OUT SPACE

Answer: .....

Question 6 Calculator (3 marks)

A box contains 4 black pens and x blue pens.

Two pens are taken at random from the box without replacement.
The probability that one pen of each colour is taken is $\frac{8}{15}$.

Given that $x > 4$, work out the value of x.

WORKING OUT SPACE

Answer: .....

EDEXCEL GCSE HIGHER PAPER 1 — NON-CALCULATOR (GRADE 9)

Mixed Review 1 — Choosing the Right Method (Non-Calculator)

Total: 43 marks

These 15 unseen Grade 9 questions are mixed across topics with no topic headings — just like a real Edexcel Paper 1 exam. Identify the underlying method first, set out full algebraic or geometric working, and give exact simplified answers.

Question 1 Non-Calculator **(3 marks)**

A circle has the equation $x^2 + y^2 = 225$.
Calculate the exact circumference of the circle in terms of π.

WORKING OUT SPACE

Answer: .....

Question 2 Non-Calculator **(3 marks)**

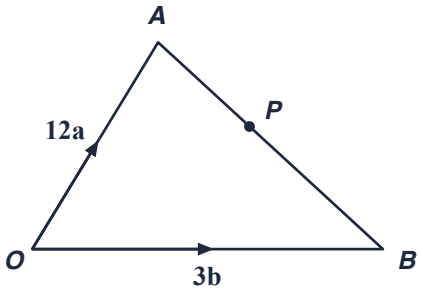
Prove algebraically that $(n+3)^2 - (n-2)^2$ is always a multiple of 5 for all integer values of n.

WORKING & PROOF SPACE

Question 3 Non-Calculator **(4 marks)**

In the diagram, OAB is a triangle with $\vec{OA} = 12\mathbf{a}$ and $\vec{OB} = 3\mathbf{b}$.
P is the point on AB such that $AP : PB = 1 : 2$.

Find $\vec{OP}$ in terms of $\mathbf{a}$ and $\mathbf{b}$ in its simplest form.



WORKING OUT SPACE

Answer: .....

Question 4 Non-Calculator (2 marks)

A tin contains green and orange sweets in the ratio $3 : 2$.

Two sweets are taken at random from the tin without replacement.

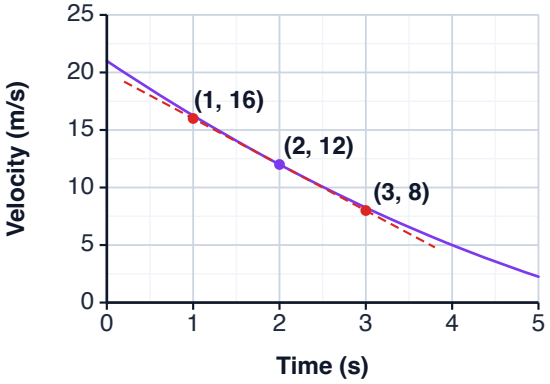
The probability that both sweets are orange is $\frac{1}{7}$.

Work out the total number of sweets in the tin before any were removed.

WORKING OUT SPACE

Answer: .....

Question 5 Non-Calculator (2 marks)



The velocity-time graph shows a vehicle slowing down. A tangent to the curve is drawn at $t = 2$ s, passing through $(1, 16)$ and $(3, 8)$.

Calculate the **rate of deceleration** (as a positive value) at $t = 2$ s in $\mathrm{m/s^2}$.

WORKING OUT SPACE

Answer: .....

Question 6 Non-Calculator (2 marks)

A circle has the equation $x^2 + y^2 = 225$.
Prove that the point $(9, -12)$ lies on the circle.

WORKING & PROOF SPACE

Question 7 Non-Calculator (2 marks)

Prove algebraically that $(3n+2)^2-(3n-2)^2$ is always a multiple of 24 for all positive integer values of n.

WORKING & PROOF SPACE

Question 8 Non-Calculator (2 marks)

A jar contains 5 purple beads and y silver beads.

A bead is taken at random from the jar, its colour is noted, and it is **replaced** in the jar.
A second bead is then taken at random.

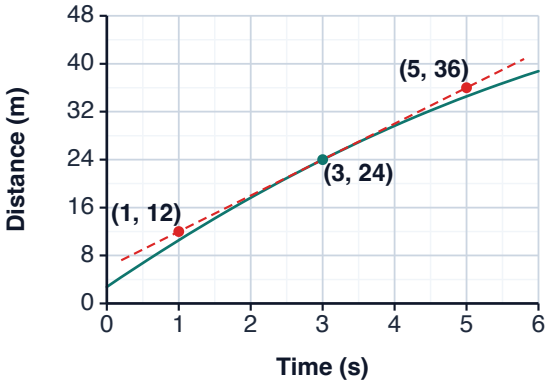
The probability that both beads are purple is $\frac{25}{144}$.

Work out the value of y.

WORKING OUT SPACE

Answer: .....

Question 9 Non-Calculator (2 marks)



The curved distance-time graph shows the distance travelled by a cyclist. A tangent to the curve has been drawn at $t=3$ s, passing through $(1,12)$ and $(5,36)$.

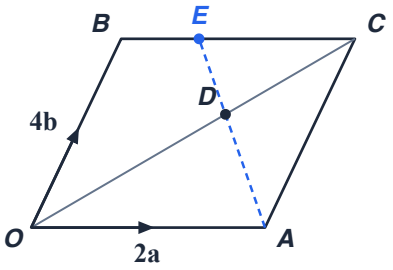
Work out the **instantaneous speed** of the cyclist at $t=3$ s in m/s.

WORKING OUT SPACE

Answer: .....

Question 10 Non-Calculator (4 marks)

The diagram shows a parallelogram $OACB$ with $\vec{OA} = 2\mathbf{a}$ and $\vec{OB} = 4\mathbf{b}$.
D is the point on OC such that $OD : DC = 3 : 2$.
E is a point on BC such that A, D, and E lie on a straight line.
Find the ratio $BE : EC$ in its simplest form.



WORKING OUT SPACE

Answer: .....

Question 11 Non-Calculator (2 marks)

Prove algebraically that the sum of the squares of any two consecutive odd integers leaves a remainder of 2 when divided by 8.

WORKING & PROOF SPACE

Question 12 Non-Calculator (3 marks)

A bag contains x red counters and $(x + 2)$ yellow counters.

Two counters are taken at random from the bag without replacement.

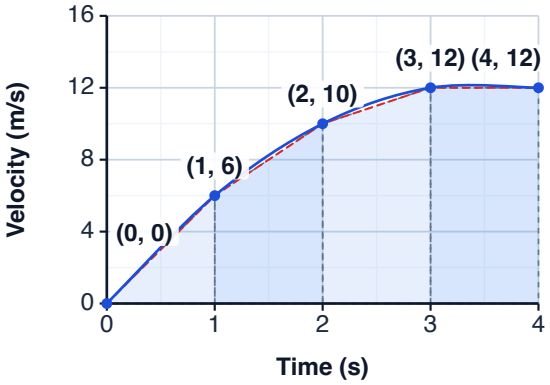
The probability that both counters are red is $\frac{2}{15}$.

Work out the value of x.

WORKING OUT SPACE

Answer: .....

Question 13 Non-Calculator (3 marks)



The velocity-time graph shows the motion of an object over 4 seconds. The area under the curve has been divided into **4 strips of equal width** ($h = 1$ s).

Use the **trapezium rule** to work out an estimate for the total distance travelled in the 4 seconds in metres.

WORKING OUT SPACE

Answer: .....

Question 14 Non-Calculator (4 marks)

A circle has the equation $x^2 + y^2 = 100$.
Find the equation of the tangent to the circle at the point $(-6, 8)$.

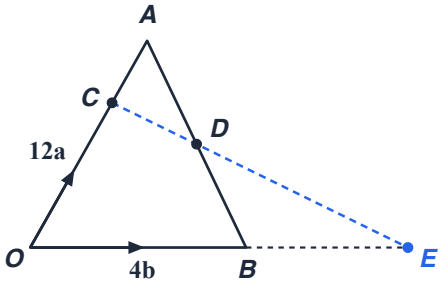
WORKING OUT SPACE

Answer: .....

Question 15 Non-Calculator (5 marks)

In the diagram, OAB is a triangle with $\vec{OA} = 12\mathbf{a}$ and $\vec{OB} = 4\mathbf{b}$.
C is the point on OA such that $OC : CA = 1 : 2$.
D is the point on AB such that $AD : DB = 3 : 1$.
The line OB is extended to a point E such that C, D, and E lie on a straight line.

Find the vector $\vec{BE}$ in terms of $\mathbf{b}$.



WORKING OUT SPACE

Answer: .....

EDEXCEL GCSE HIGHER PAPER 2 / 3 — CALCULATOR (GRADE 9)

Mixed Review 2 of 2

Mixed Review 2 — Choosing the Right Method (Calculator)

Total: 46 marks

These 15 unseen Grade 9 questions are interleaved across topics to test method selection under Paper 2/3 conditions. Write down every equation, substitution, or area calculation clearly before rounding your final answer.

Question 1 Calculator

(1 mark)

A circular radar boundary is modelled by $x^2 + y^2 = 361$.
What is the radius of the boundary in km?

WORKING OUT SPACE

Answer: .....

Question 2 Calculator

(3 marks)

There are n counters in a bag.
6 of the counters are white and the rest are blue.

Two counters are taken at random from the bag without replacement.

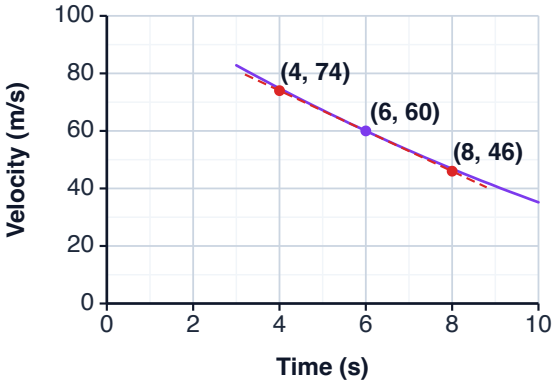
The probability that both counters are white is $\frac{3}{38}$.

Work out the value of n.

WORKING OUT SPACE

Answer: .....

Question 3 Calculator (2 marks)



The velocity-time graph shows a vehicle slowing down. A tangent to the curve is drawn at $t = 6$ s, passing through $(4, 74)$ and $(8, 46)$.

Calculate the **rate of deceleration** (as a positive value) at $t = 6$ s in $\mathrm{m/s^2}$.

WORKING OUT SPACE

Answer: .....

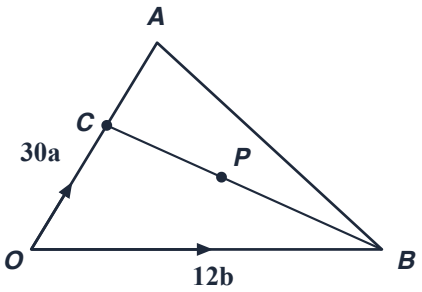
Question 4 Calculator (2 marks)

Prove algebraically that the sum of $n(n + 1)$ and $n + 1$ is always a square number.

WORKING & PROOF SPACE

Question 5 Calculator (4 marks)

In the diagram, OAB is a triangle with $\vec{OA} = 30\mathbf{a}$ and $\vec{OB} = 12\mathbf{b}$.
C is the midpoint of OA, and P is the point on CB such that $CP : PB = 1 : 2$.
Find $\vec{OP}$ in terms of $\mathbf{a}$ and $\mathbf{b}$ in its simplest form.



WORKING OUT SPACE

Answer: .....

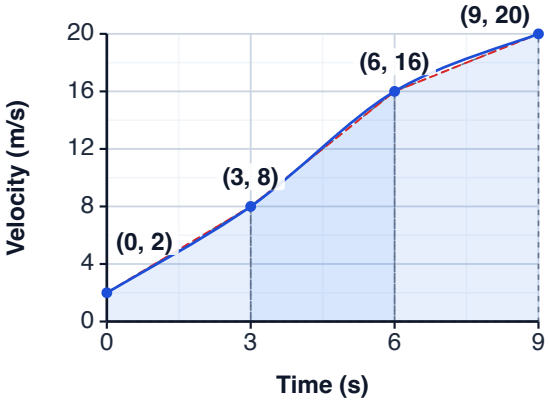
Question 6 Calculator (4 marks)

A circle has the equation $x^2 + y^2 = 169$.
Find the equation of the tangent to the circle at the point $(-5, 12)$.

WORKING OUT SPACE

Answer: .....

Question 7 Calculator (3 marks)



The velocity-time graph shows the motion of an object over 9 seconds. The area under the curve has been divided into **3 strips of equal width** ($h = 3$ s).

Use the **trapezium rule** to work out an estimate for the total distance travelled in the 9 seconds in metres.

WORKING OUT SPACE

Answer: .....

Question 8 Calculator (3 marks)

There are only red counters, yellow counters and black counters in a bag.
There are 2 times as many red counters as yellow counters.
There are 3 black counters.

Two counters are taken at random from the bag without replacement.
The probability that both counters are yellow is $\frac{2}{35}$.

Work out the number of **red** counters in the bag.

WORKING OUT SPACE

Answer: .....

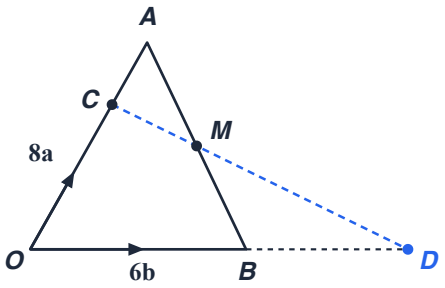
Question 9 Calculator (2 marks)

Prove algebraically that $(5n + 5)^2 - (5n - 5)^2$ is always a multiple of 100 for all positive integer values of n.

WORKING & PROOF SPACE

Question 10 Calculator (5 marks)

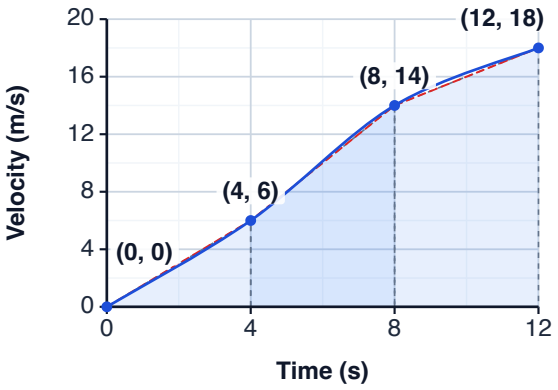
In the diagram, OAB is a triangle with $\vec{OA} = 8\mathbf{a}$ and $\vec{OB} = 6\mathbf{b}$.
C is the point on OA such that $\vec{OC} = 6\mathbf{a}$.
M is the midpoint of AB.
D is the point on OB extended such that C, M, and D lie on a straight line.
Find the vector $\vec{OD}$ in terms of $\mathbf{b}$.



WORKING OUT SPACE

Answer: .....

Question 11 Calculator (3 marks)



The velocity-time graph shows the motion of an object over 12 seconds. The area under the curve has been divided into **3 strips of equal width** ($h = 4$ s).

Use the **trapezium rule** to work out an estimate for the total distance travelled in the 12 seconds in metres.

WORKING OUT SPACE

Answer: .....

Question 12 Calculator (2 marks)

Prove algebraically that $(2n+2)^2 + (2n+4)^2$ is always a multiple of 4 for all integer values of n.

WORKING & PROOF SPACE

Question 13 Calculator (4 marks)

A circle has the equation $x^2 + y^2 = 289$.
Find the equation of the tangent to the circle at the point $(15, -8)$.

WORKING OUT SPACE

Answer: .....

Question 14 Calculator (3 marks)

A bag contains $(x+1)$ red counters and $(2x-1)$ yellow counters.

Two counters are taken at random from the bag without replacement.

The probability that the first counter is red and the second counter is yellow is $\frac{5}{18}$.

Work out the total number of counters in the bag before any were removed.

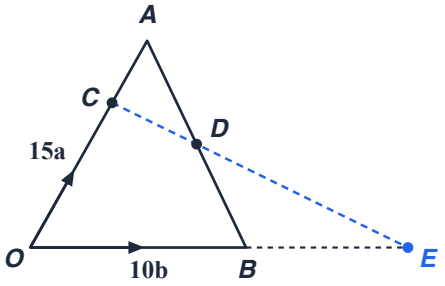
WORKING OUT SPACE

Answer: .....

Question 15 Calculator (5 marks)

In the diagram, OAB is a triangle with $\vec{OA} = 15\mathbf{a}$ and $\vec{OB} = 10\mathbf{b}$.
C is the point on OA such that $OC : CA = 1 : 2$.
D is the point on AB such that $AD : DB = 4 : 1$.
The line OB is extended to a point E such that C, D, and E lie on a straight line.

Find the vector $\vec{BE}$ in terms of $\mathbf{b}$.



WORKING OUT SPACE

Answer: .....

APPENDIX

Answers & Mark Schemes

Complete Edexcel Higher answers, required factorised algebraic forms, and Mixed Review topic guides.

Topic 1: Algebraic Proof

Q1 (Non-Calc):	$8n^2+8n+4 = 4(2n^2+2n+1)$	[3m]
Q2 (Non-Calc):	$8n+8 = 8(n+1)$	[3m]
Q3 (Non-Calc):	$2n^2+2n+1 = 2(n^2+n)+1$	[3m]
Q4 (Non-Calc):	$60n$ **(multiple of 60)**	[3m]
Q5 (Non-Calc):	$n^2+4n+4=(n+2)^2$	[3m]
Q6 (Non-Calc):	$4n^2+4n+1 = 4n(n+1)+1 = 8k+1$	[4m]

Topic 2: Equation of a Circle

Q1 (Non-Calc):	**15**	[1m]
Q2 (Calc):	$(-8)^2+15^2 = 64+225 = 289$	[2m]
Q3 (Non-Calc):	225π	[2m]
Q4 (Non-Calc):	**(a)** $k=6$, **(b)** $\frac{3}{2}$	[3m]
Q5 (Calc):	$y=-\frac{8}{15}x+\frac{289}{15}$	[4m]
Q6 (Calc):	**(a)** $y=-\frac{5}{12}x+\frac{169}{12}$ **(b)** $\frac{28561}{120}$	[5m]

Topic 3: Gradients & Rates of Change

Q1 (Non-Calc):	**4**	[2m]
Q2 (Calc):	**3.5**	[2m]
Q3 (Non-Calc):	**5**	[2m]
Q4 (Calc):	**89**	[3m]
Q5 (Calc):	**8**	[3m]
Q6 (Non-Calc):	**(a)** $68\ \text{m}$ **(b) Underestimate (chords below curve)**	[4m]

Topic 4: Vector Proofs

Q1 (Non-Calc):	$6\mathbf{a}+2\mathbf{b}$	[4m]
Q2 (Non-Calc):	$k=\frac{1}{5}$	[4m]
Q3 (Non-Calc):	$\overrightarrow{CD}=4\overrightarrow{CM}=-4\mathbf{a}+8\mathbf{b}$ **(common point C)**	[5m]
Q4 (Non-Calc):	$\overrightarrow{AE}=\frac{3}{2}\overrightarrow{AD}=-3\mathbf{a}+6\mathbf{b}$ **(common point A)**	[4m]
Q5 (Non-Calc):	**2:1**	[4m]
Q6 (Calc):	$50\mathbf{b}$	[5m]

Topic 5: Probability Equations

Q1 (Non-Calc):	**10**	[3m]
Q2 (Calc):	**9**	[4m]
Q3 (Non-Calc):	**12**	[3m]
Q4 (Non-Calc):	**5**	[3m]
Q5 (Calc):	**16**	[3m]
Q6 (Calc):	**6**	[3m]

Mixed Review 1 — Choosing the Right Method (Non-Calculator) — Answers & Topic Guide

Q1 (Equation of a Circle, Non-Calc): 30π [3m]

Q2 (Algebraic Proof, Non-Calc): $10n + 5 = 5(2n + 1)$ [3m]

Q3 (Vector Proofs, Non-Calc): $8\mathbf{a} + \mathbf{b}$ [4m]

Q4 (Probability Equations, Non-Calc): **15** [2m]

Q5 (Gradients & Rates, Non-Calc): **4** [2m]

Q6 (Equation of a Circle, Non-Calc): $9^2 + (-12)^2 = 81 + 144 = 225$ [2m]

Q7 (Algebraic Proof, Non-Calc): $24n$ **(multiple of 24)** [2m]

Q8 (Probability Equations, Non-Calc): **7** [2m]

Q9 (Gradients & Rates, Non-Calc): **6** [2m]

Q10 (Vector Proofs, Non-Calc): **1:2** [4m]

Q11 (Algebraic Proof, Non-Calc): $8n^2 + 16n + 10 = 8(n^2 + 2n + 1) + 2$ [2m]

Q12 (Probability Equations, Non-Calc): **4** [3m]

Q13 (Gradients & Rates, Non-Calc): **34** [3m]

Q14 (Equation of a Circle, Non-Calc): $y = \frac{3}{4}x + \frac{25}{2}$ [4m]

Q15 (Vector Proofs, Non-Calc): $8\mathbf{b}$ [5m]

Mixed Review 2 — Choosing the Right Method (Calculator) — Answers & Topic Guide

Q1 (Equation of a Circle, Calc): **19** [1m]

Q2 (Probability Equations, Calc): **20** [3m]

Q3 (Gradients & Rates, Calc): **7** [2m]

Q4 (Algebraic Proof, Calc): $n^2 + 2n + 1 = (n + 1)^2$ [2m]

Q5 (Vector Proofs, Calc): $10\mathbf{a} + 4\mathbf{b}$ [4m]

Q6 (Equation of a Circle, Calc): $y = \frac{5}{12}x + \frac{169}{12}$ [4m]

Q7 (Gradients & Rates, Calc): **105** [3m]

Q8 (Probability Equations, Calc): **8** [3m]

Q9 (Algebraic Proof, Calc): $100n$ **(multiple of 100)** [2m]

Q10 (Vector Proofs, Calc): $9\mathbf{b}$ [5m]

Q11 (Gradients & Rates, Calc): **116** [3m]

Q12 (Algebraic Proof, Calc): $8n^2 + 24n + 20 = 4(2n^2 + 6n + 5)$ [2m]

Q13 (Equation of a Circle, Calc): $y = \frac{15}{8}x - \frac{289}{8}$ [4m]

Q14 (Probability Equations, Calc): **9** [3m]

Q15 (Vector Proofs, Calc): $10\mathbf{b}$ [5m]