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# A-level Maths

Transition Task

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This is a PDF version of the lesson. To access the narrated version, with the worked answers, please follow the link below.

[Maths.pptx](#)

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When working through the A-level Maths transition tasks, please **complete and mark** your work in a notebook or on A4 paper which you can hand in when you arrive at your first lesson in September.

Please **don't** complete your transition task for all your subjects in the same book as we will want to take in your work for checking.

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- The next slides give solutions to a selection of questions from each section.
  - Email [dcrocker@coombedean.co.uk](mailto:dcrocker@coombedean.co.uk) if you need more help.

# Indices

The screenshot shows a OneNote application window titled "OneNote for Windows 10" with the user "D.Crocker". The ribbon includes tabs for Home, Insert, Draw, View, Help, and Class Notebook. The "Draw" tab is active, showing various drawing tools. The main content area contains a list of problems:

5 By writing 16 as a power of 2, or otherwise, solve the equation  $16^x = 32$ .

6 Solve these equations.

a  $8^x = 16$       b  $16^x = 64$

c  $9^x \times 3^x = 9$       d  $\frac{8^x}{4^{x+1}} = 32$

7 Express these terms in the form  $ax^n$  where  $a$  is a real number.

a  $\frac{4x}{2x^2}$       b  $\frac{1}{2x^3}$

c  $3x\sqrt{x}$       d  $\frac{\sqrt[3]{x^2}}{4}$

The Windows taskbar is visible at the bottom, showing the Start button and several application icons. The system tray in the bottom right corner displays the time "20:28" and the date "04/06/2023".

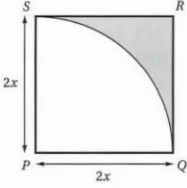
# Basic Algebra

OneNote for Windows 10

Home Insert Draw View Help Class Notebook

Shapes Link to Shape Link to Text Maths

6 The diagram shows a square  $PQRS$  of side length  $2x$  cm. A quarter circle, centre  $P$  and radius  $2x$  cm, is inscribed inside the square.



a Show that the area  $A$  of the shaded shape is given by the formula  $A = 4x^2 - \pi x^2$ .

b Make  $x$  the subject of this formula.

c Show that the perimeter of the shaded shape is given by the expression  $(4 + \pi)\sqrt{\frac{A}{4 - \pi}}$ .

10 Make the letter indicated in square brackets the subject of these formulae.

a  $A = \frac{B - 2}{B}$  [B]

b  $C = \frac{D^2 + 4}{D^2}$  [D]

c  $E = \frac{5 - 4F^3}{F^3}$  [F]

11 Make the letter indicated in square brackets the subject of these formulae.

a  $A = \frac{B}{B - 2}$  [B]

b  $C = \frac{D + 2}{2D + 3}$  [D]

c  $E = \frac{F^2 + 3}{F^2 + 1}$  [F]

12 Simplify these fractions.

a  $\frac{x^2 + 3x}{x}$  b  $\frac{2x^4 + 4x^2}{x^2}$

c  $\frac{3x^2 - 3x}{x - 1}$  d  $\frac{x^2 - 2x^3}{2x - 1}$

21:26 04/06/2023

# Forming Expressions

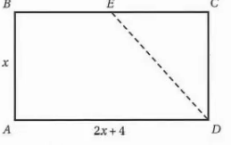
← → OneNote for Windows 10 D.Crocker

Home Insert Draw View Help Class Notebook

Undo Redo Ink Highlighter Eraser Pencil + Shapes Ink to Shape Link to Text Maths

1 The diagram shows a rectangle  $ABCD$ . Point  $E$  is the mid-point of  $BC$ .

$AB = x$ ,  $AD = 2x + 4$



a Find an expression in terms of  $x$  for the perimeter of this rectangle.

b Show that the area of the trapezium  $ABED$  is given by the formula

$$\text{Area} = \frac{3}{2}x(x + 2).$$

Windows Taskbar: 21:38 04/06/2023

# Straight-line Graphs

The screenshot shows a OneNote for Windows 10 window with a purple title bar. The ribbon includes tabs for Home, Insert, Draw, View, Help, and Class Notebook. The Draw tab is active, showing various drawing tools. The left sidebar contains icons for navigation and search. The main content area displays the following text:

**Straight-line graphs**

The line  $L$  has equation  $ay + bx = 10$ , where  $a$  and  $b$  are constants.

The line crosses the  $y$ -axis at the point  $(0,5)$  and crosses the  $x$ -axis at the point  $(-2,0)$ .

**a** Using this information, or otherwise, find the value of  $a$  and the value of  $b$ .

The point  $P(4,q)$  lies on this line.

**b** Find the value of  $q$ .

The Windows taskbar is visible at the bottom, showing icons for various applications and the system clock displaying 21:43 on 04/06/2023.



# The equation of a line $y - y_1 = m(x - x_1)$

The screenshot shows a OneNote for Windows 10 window with a purple title bar. The ribbon includes tabs for Home, Insert, Draw, View, Help, and Class Notebook. The Draw tab is active, showing various drawing tools. The main content area contains a math problem and a hint.

**The equation of a line**

7 A line passes through the points  $S(3, -2)$  and  $T(12, -14)$ . This line crosses the  $y$ -axis at point  $A$  and the  $x$ -axis at point  $B$ .

**Handy hint**  
Sketch the line.

**a** Find the coordinates of  $A$  and the coordinates of  $B$ .

**b** Show that the distance  $AB = \frac{5}{2}$ .

The Windows taskbar is visible at the bottom, showing icons for various applications and the system clock displaying 21:47 on 04/06/2023.