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# A-level Maths

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Transition Task

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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.
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# Indices

The screenshot shows the OneNote application interface. The title bar at the top reads "OneNote for Windows 10" and "D.Crocker". The ribbon includes tabs for "Home", "Insert", "Draw", "View", "Help", and "Class Notebook". The "Insert" tab is active, showing options for "Shapes", "Link to Shape", "Link to Text", and "Maths". The main content area contains the following text:

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

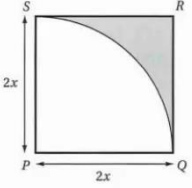
OneNote for Windows 10

Home Insert Draw View Help Class Notebook

Shapes Link to Shape Link to Text Maths

D.Crocker

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

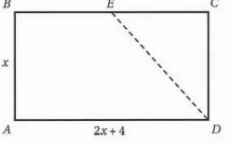
OneNote for Windows 10 | D.Crocker

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

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

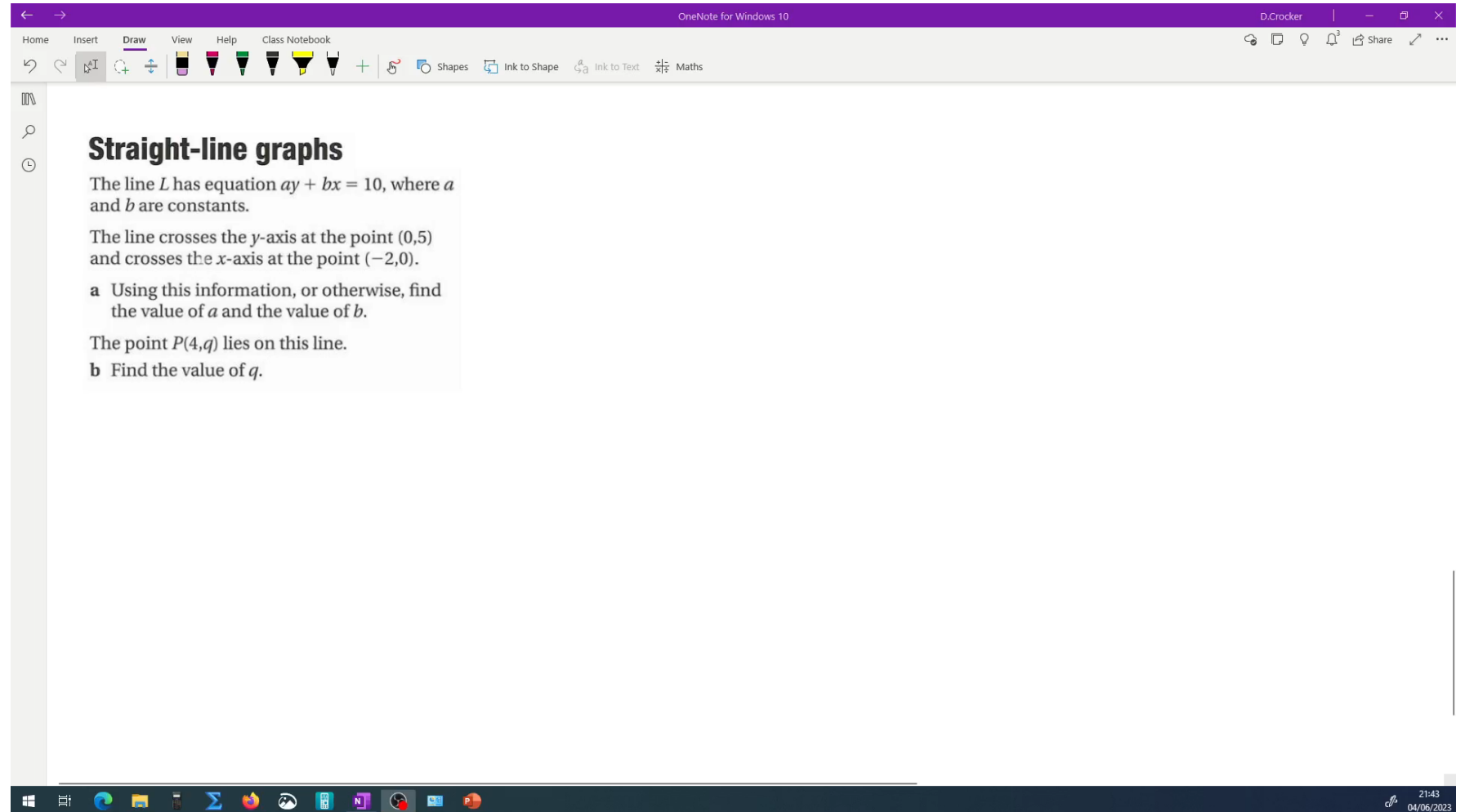


a Find an expression in terms of  $x$  for the perimeter of this rectangle.

b Show that the area of the trapezium  $ABED$  is given by the formula  
Area =  $\frac{3}{2}x(x + 2)$ .

21:38 04/06/2023

# Straight-line Graphs



The screenshot shows a OneNote window titled "OneNote for Windows 10" with the user name "D.Crocker". The ribbon includes "Home", "Insert", "Draw", "View", "Help", and "Class Notebook". The "Draw" tab is active, showing various drawing tools. The main content area contains 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 the Start button and several application icons. The system tray in the bottom right corner displays the time "21:43" and the date "04/06/2023".

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

The screenshot shows the OneNote application interface. The title bar at the top indicates 'OneNote for Windows 10' and the user 'D.Crocker'. The ribbon includes 'Home', 'Insert', 'Draw', 'View', 'Help', and 'Class Notebook'. The 'Draw' tab is active, showing various drawing tools. The main content area contains the following text:

**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 the Start button and several application icons. The system tray in the bottom right corner displays the time '21:47' and the date '04/06/2023'.