

Factor, solve or simplify each expression in Table I. Then, find the corresponding answer in Table II. This will give you a correspondence between a letter and a number. Use this to reveal the mystery phrase.

## Mystery phrase

" T H I S B E I N G , T H A T B E C O M E S ; "

1 2 6 7      4 9 6 5 10      1 2 8 1      4 9 3 11 12 9 7

(Dependent origination)

Table I

<p><b>O</b> → 11</p> <p>Simplify</p> $(2x^3 - 5)^2$ $(2x^3)^2 - 2(2x^3) \cdot 5 + 25$ $= 4x^6 - 20x^3 + 25$	<p><b>N</b> → 5</p> <p>Factor</p> $3y^3 - 27y$ $3y(y^2 - 9) =$ $= 3y(y+3)(y-3)$	<p><b>E</b> → 9</p> <p>Simplify</p> $\left(\frac{1}{2}x^2y^3\right)^3 \cdot \left(\frac{1}{3}x^3\right)^2$ $\frac{1}{8}x^6y^9 \cdot \frac{1}{9}x^6 =$ $= \frac{1}{72}x^{12}y^9$	<p><b>A</b> → 8</p> <p>Factor</p> $x^2 + 8x + 16$ $(x+4)^2$
<p><b>T</b> → 1</p> <p>Factor</p> $6x^2 + 11x - 10$ $\begin{array}{r rr} M & A & \\ \hline -6 & 11 & 15, -4 \end{array}$ $6x^2 + 15x - 4x - 10 =$ $= 3x(2x+5) - 2(2x+5) =$ $(2x+5)(3x-2)$	<p><b>C</b> → 3</p> <p>Solve</p> $1 - 6x = -9x^2$ $9x^2 - 6x + 1 = 0$ $(3x-1)^2 = 0$ $X = \frac{1}{3}$	<p><b>B*</b> → 4</p> <p>Solve</p> $x^3 + 2x^2 = 9x + 18$ $x^2(x+2) = 9(x+2)$ $(x^2-9)(x+2) = 0$ $(x+3)(x-3)(x+2) = 0$ $x = 3, x = -3, x = -2$	<p><b>M</b> → 12</p> <p>Simplify</p> $\left(\frac{1}{2}x^2y^3\right)^3 \div \left(\frac{1}{3}x^4\right)^2$ $\frac{\frac{1}{8}x^6y^9}{\frac{1}{9}x^8} = \frac{9}{8} \frac{y^9}{x^2}$
<p><b>I</b> → 6</p> <p>Factor</p> $x^6 - 27$ $(x^2)^3 - 3^3 =$ $(x^2-3)(x^4+3x^2+9)$	<p><b>H</b> → 2</p> <p>Factor</p> $6x^2 - 5x + 1$ $\begin{array}{r rr} M & A & T \\ \hline 6 & -5 & -3, -2 \end{array}$ $6x^2 - 3x - 2x + 1 =$ $3x(2x-1) - 1(2x-1) =$ $(3x-1)(2x-1)$	<p><b>S</b> → 7</p> <p>Solve</p> $x^2 - 2x = 0$ $x(x-2) = 0$ $x = 0$ $x = 2$	<p><b>G</b> → 10</p> <p>Factor</p> $x^9 + 27y^3$ $(x^3)^3 + (3y)^3 =$ $= (x^3+3y)(x^6-3x^3y+9y^2)$

Table II

1 ✓ $(3x - 2)(2x + 5)$	4 ✓ $3, -3, -2$	5 ✓ $3y(y + 3)(y - 3)$	2 ✓ $(2x - 1)(3x - 1)$
11 ✓ $4x^6 - 20x^3 + 25$	3 ✓ $\frac{1}{3}$	9 ✓ $\frac{x^{12}y^9}{72}$	6 ✓ $(x^2 - 3)(x^4 + 3x^2 + 9)$
7 ✓ $x = 0$ or $x = 2$	10 ✓ $(x^3 + 3y)(x^6 - 3x^3y + 9y^2)$	8 ✓ $(x + 4)^2$	12 ✓ $\frac{9y^9}{8x^2}$

Some extra challenge factoring:

1. Factor:  $16x^2 + 2x + \frac{1}{16}$

$(4x)^2$

$(\frac{1}{4})^2$

$$\left(4x + \frac{1}{4}\right)^2$$

2. Factor:  $2xy - 4x^2 - \frac{y^2}{4}$

$$= -\left(4x^2 - 2xy + \frac{y^2}{4}\right) = -\left(2x - \frac{y}{2}\right)^2$$

3. Factor:  $-x - 4 + \frac{x^2}{2} = \frac{1}{2}(x^2 - 2x - 8) = \frac{1}{2}(x^2 - 4x + 2x - 8) =$

M	A	T
-8	-2	-4, +2

$$= \frac{1}{2}(x(x-4) + 2(x-4)) =$$

$$= \frac{1}{2}(x-4) \cdot (x+2)$$