

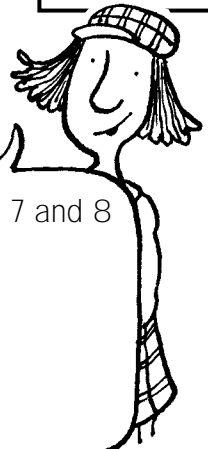
The root of the problem

Estimate square roots and cube roots

C

Terri is explaining how to find an approximate value of x without using the $\sqrt{\quad}$ key on her calculator.

$$x = \sqrt{55}$$



- 55 comes between the square numbers 49 and 64, so x must be between 7 and 8
- Using a calculator, square 7.5 $\longrightarrow 7.5^2 = 56.25 \dots$ too large
So x must be smaller than 7.5
- Square the number 7.3 $\longrightarrow 7.3^2 = 53.29 \dots$ too small
So x must be larger than 7.3. Try 7.4 $\longrightarrow 7.4^2 = 54.76 \dots$ too small
- Carry on in this way by choosing a decimal between 7.4 and 7.5

1. Find the number with **two decimal places** that, when squared, gives the answer closest to (a) 55 and (b) 75. Use the method above and show your working.

<p>(a) $x = \sqrt{55}$ $7.5^2 = 56.25 \dots$ too large $7.3^2 = 53.29 \dots$ too small $7.4^2 = 54.76 \dots$ too small</p> <p style="text-align: right; margin-right: 50px;">$x =$ to 2 d.p.</p>	<p>(b) $x = \sqrt{75}$</p> <p style="text-align: right; margin-right: 50px;">$x =$ to 2 d.p.</p>
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2. Use the same method to find the approximate value of x in these questions.

<p>(a) $x = \sqrt{65}$</p> <p style="text-align: right; margin-right: 50px;">$x =$ to 2 d.p.</p>	<p>(b) $x = \sqrt{96}$</p> <p style="text-align: right; margin-right: 50px;">$x =$ to 2 d.p.</p>
<p>(c) $x^2 = 86$</p> <p style="text-align: right; margin-right: 50px;">$x =$ to 2 d.p.</p>	<p>(d) $x^2 = 42$</p> <p style="text-align: right; margin-right: 50px;">$x =$ to 2 d.p.</p>

NOW TRY THIS!

- Use the method above to find the approximate values of x , *without* using the $\sqrt[3]{\quad}$ key.

(a) $x = \sqrt[3]{53}$ _____	(b) $x^3 = 74$ _____	(c) $x^3 = 3$ _____
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Finding the square root is finding which number has been multiplied by itself to get the given number: for example, the square root of 16 is 4, because $4 \times 4 = 16$.