Year 10 | Number

Exact values and accumulated error

Learn and practise | Free preview

A sample from this topic. The complete topic collection contains three different resources and worked solutions.

Read the explanation and worked example. Show your working; use a calculator only where asked.

What you will practise

• Compare exact calculation with repeated approximation.

• Explain a method and check the reasonableness of a result.

Useful starting skills: Use the prerequisite operations and representations shown in the worked example.

Rounding changes a value. Reusing a rounded value in later operations may amplify or accumulate the error; exact fractions or symbolic forms preserve the relationship.

Keep sufficient precision internally and round the final report to a context-appropriate accuracy. Distinguish rounding each transaction from rounding one final mathematical total.

Worked example

Compare $3\times(1/3)$ with 3×0.33.

Exact product is 1.

Rounded-input product is 0.99.

Answer: Difference 0.01

Try it yourself

Name: _____ Date: _____

1. Compare $7\times(1/7)$ with 7×0.143.

2. Find exact area of radius 6 cm, then use $\pi\approx3.14$.

Answers and explanations

Check the method as well as the final answer. An alternative correct method is also valid.

1. 1 versus 1.001

The rounded value is slightly high.

2. 36π cm² versus 113.04 cm²

The approximation replaces π by 3.14.

Curriculum reference: VC2M10N01

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