Two's complement: binary to denary 1

Convert the binary number 11101001 to denary. The binary value is encoded as an 8-bit **two's complement** number.

- ○ +105

- ○ -23

- ○ +233

- ○ -105

Two's complement: binary to denary 3

Practice 1

Convert the binary number 10001010 to denary. The binary value is encoded as an 8-bit **two's complement** number.

Type your answer as a **signed decimal number** (e.g. +3.75). Do not leave any spaces in your answer.

Quiz:

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Two's complement: denary to binary 1

Practice 2
Ⓟ Ⓟ

Convert the value $+28_{10}$ to an 8-bit two's complement binary number.

- ◯ 11100000

- ◯ 00011100

- ◯ 11100100

- ◯ 011100

Quiz:

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Two's complement: denary to binary 2

Practice 2
Ⓟ Ⓟ

Convert the value -49_{10} to an 8-bit two's complement binary number.

Quiz:

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Two's complement: range 1

Practice 1

P P

Signed integers can be stored in two's complement form. What is the range of values that can be stored using 8 bits in two's complement?

○ +127 to -128

○ +255 to -256

○ +128 to -128

○ +256 to -256

Quiz:

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Signed fixed: binary to denary 1

Challenge 1

Select the denary number that is the same value as the binary number 110011.1001 to denary. It is represented in **two's complement fixed point form** with 6 places before the binary point and 4 places after the binary point.

○ -13.5625 (or $-13\frac{9}{16}$ or $-\frac{217}{16}$)

○ -3.109375 (or $-3\frac{7}{64}$ or $-\frac{199}{64}$)

○ -51.5625 (or $-51\frac{9}{16}$ or $-\frac{825}{16}$)

○ -12.4375 (or $-12\frac{7}{16}$ or $-\frac{199}{16}$)

Quiz:
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Signed fixed: binary to denary 4

Convert the binary number 101011.10110 to denary. It is represented in **two's complement fixed point form** with 6 places before the binary point and 5 places after the binary point.

Type your answer as a **signed decimal number** (e.g. +3.75). Do not leave any spaces in your answer.

Quiz:

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Signed fixed: denary to binary 1

Challenge 1

C c

Each binary number below is encoded as a **fixed point two's complement number** with 4 places before the binary point and 4 places after the binary point. Select the binary number that is the same value as the denary number $-4\frac{3}{4}$ (or $-\frac{19}{4}$ or -4.75 as a decimal).

○ 01001100

○ 11000100

○ 10110100

○ 11001100

Quiz:

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Signed fixed: denary to binary 2

Challenge 2

C C

Convert the denary number $-11\frac{3}{8}$ (or $-\frac{91}{8}$ or -11.375 as a decimal) to binary. It must be encoded as a **fixed point two's complement number** with 5 places before the binary point and 4 places after the binary point.

Type your answer as a 9-bit binary number **without a binary point** (e.g. 111110000). Do not leave any spaces in your answer.

Quiz:

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Absolute and relative error 2

Challenge 2
C C

Calculate the absolute and relative error that is caused due to the **truncated** representation of 0.2_{10} in binary using 8 bits.

Original value in denary	Truncated representation in binary using 8 bits	Absolute error	Relative error
0.2_{10}	0.0011010_2	?	?

Part A

Enter the value of the **absolute error** in denary.

Part B

Enter the value of the **relative error** as a percentage (but do not include the percentage sign).

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