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Question

In 16-bit 2's complement representation, the decimal number -28 is:

(A) 1111 1111 0001 1100

(B) 0000 0000 1110 0100

(C) 1111 1111 1110 0100

(D) 1000 0000 1110 0100

Solution

Step 1: Write +28 in 16-bit binary:

$$28 = 0000\ 0000\ 0001\ 1100$$

Step 2: Take the 1's complement (invert all bits):

$$1111\ 1111\ 1110\ 0011$$

Step 3: Add 1 to obtain the 2's complement:

$$1111\ 1111\ 1110\ 0100$$

Therefore, the correct answer is

$$\boxed{\text{(C) } 1111\ 1111\ 1110\ 0100}.$$