Problem of the Week
Problem B and Solution
Rounding Equivalents

Problem

Sometimes the process of rounding numbers produces interesting results. For example, if you round the number 39.99 to the nearest ten, you get 40, if you round it to the nearest whole number, you get 40, and if you round it to the nearest tenth, you get 40.0. Notice that you get the same numerical value when rounding 39.99 to the nearest ten, whole number, and tenth.

(a) Find a number less than 100 with two decimal places such that when you round to the nearest tenth you get the same numerical value as when you round to the nearest whole number.

(b) Find a number less than 100 with two decimal places such that when you round to the nearest tenth you get the same numerical value as when you round to the nearest ten.

(c) Find the smallest number between 99 and 100 that has two decimal places that rounds to the same numerical value when you round to the nearest tenth, whole number, ten, and hundred.

Solution

(a) Answers will vary. One possible answer is 18.96.
Rounding 18.96 to the nearest tenth yields 19.0.
Rounding 18.96 to the nearest whole number yields 19.

(b) Answers will vary. One possible answer is 20.03.
Rounding 20.03 to the nearest tenth yields 20.0.
Rounding 20.03 to the nearest ten yields 20.

(c) When the number is between 99 and 100, it must be 100 when rounded to the nearest hundred.
Therefore, the number rounded to the nearest tenth would be 100.0. The numbers less than 100 that have two decimal places that round to 100.0 when rounded to the nearest tenth are

$$99.99, \ 99.98, \ 99.97, \ 99.96 \text{ and } 99.95$$

(Note that 99.94 will round to 99.9 when rounded to the nearest tenth.) Therefore, the smallest of these numbers is 99.95.
Notice that 99.95 does indeed yield 100.0 or 100 when rounded to the nearest tenth, whole number, ten, or hundred.