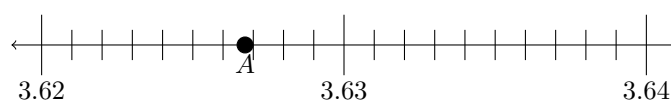


Decimals

Problems about decimal numbers.

Problem 1 On the number line below, a point is marked A . Select all options which could be candidates for the value of A .



Select All Correct Answers:

- (a) 3.6278 ✓
- (b) 3.627783 ✓
- (c) 3.68
- (d) 3.62788983 ✓
- (e) 3.629

Problem 2 Select all fractions below which have terminating decimal representation.

Select All Correct Answers:

- (a) $\frac{1}{10}$ ✓
- (b) $\frac{1}{30}$
- (c) $\frac{1}{80}$ ✓
- (d) $\frac{1}{64}$ ✓
- (e) $\frac{1}{125}$ ✓

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(f) $\frac{1}{250}$ ✓

(g) $\frac{1}{385}$

(h) $\frac{1}{2048}$ ✓

(i) $\frac{1}{4228}$

(j) $\frac{1}{2^{19} \times 5^{47}}$ ✓

Problem 3 A harder version of the previous problem: select all fractions below which have terminating decimal representation.

Select All Correct Answers:

(a) $\frac{14}{10}$ ✓

(b) $\frac{6}{30}$ ✓

(c) $\frac{4}{60}$

(d) $\frac{7}{98}$

(e) $\frac{11}{125}$ ✓

(f) $\frac{3}{150}$ ✓

(g) $\frac{11}{385}$

(h) $\frac{2}{2049}$

(i) $\frac{1057}{4228}$ ✓

(j) $\frac{3^4 \times 7^{11} \times 19}{3^2 \times 5^{22} \times 19}$ ✓

Hint: Don't forget to reduce the fractions to lowest terms!

Problem 4 Give an example of an irrational number. For a challenge, don't pick π , e , or \sqrt{p} where p is prime.

Free Response: **Hint:** One of my favorites is $0.01001000100001000001\dots$. This number's decimal representation is neither terminating nor repeating, though it does have a pattern!

Problem 5 Without doing the long division, after how many places would you expect $\frac{1}{47}$ to repeat?

We expect the repetition to occur after at most $\frac{46}{\text{given}}$ places.

Problem 6 Without doing the long division, after how many places would you expect $\frac{3}{104}$ to repeat?

We expect the repetition to occur after at most $\frac{103}{\text{given}}$ places.

Problem 7 We have seen that $0.\overline{9} = 1$. Using these same ideas, what are the following numbers equal to?

(a) $1.\overline{9} = \boxed{2}$

(b) $0.5\overline{9} = \boxed{0.6}$

(c) $2.34\overline{9} = \boxed{2.35}$

(d) $0.87893\overline{9} = \boxed{0.87894}$