Winter Quiz 2

MATH 100:11 Mathematical Concepts
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Name: SOLUTIONS

You may use calculators, but each question can be done without them. This quiz is double-sided! Be sure to explain your answers. Even if you get the correct answer, you may not get full marks if you haven't explained how. However, if you don't get the correct answer, you may get partial marks for trying something- so don't leave anything blank! The total quiz is out of 10, and the mark value for each question is given beside the question.

1. Convert the fraction 5/7 to decimal and **show your work.** [2]

$$
\begin{array}{r}
0.714285 \\
7\overline{)\,5.0000000} \\
49 \\
\hline
10 \\
7 \\
\hline
30 \\
28 \\
\hline
20 \\
14 \\
\hline
60 \\
56 \\
\hline
40 \\
35 \\
\hline
50 \quad \text{back to start}
\end{array}
$$

$\frac{5}{7} = 0.714285\,714285\ldots$

$= 0.\overline{714285}$

2. Simplify: $\sqrt{75} + \sqrt{192}$. Do NOT use decimals. [2]

$\sqrt{75} = \sqrt{25 \times 3} = 5\sqrt{3}$

$\sqrt{192} = \sqrt{64 \times 3} = 8\sqrt{3}$

So $\sqrt{75} + \sqrt{192} = 5\sqrt{3} + 8\sqrt{3} = 13\sqrt{3}$

3. Give an example of two irrational numbers x and y such that $x + y$ is rational. Explain. [2]

ex $x = \pi$ $y = -\pi$ $x+y = 0$

$\pi, -\pi$ are both irrational, 0 is rational

or ex $x = .12122122212222\ldots$ both irrational

$y = .21211211121111\ldots$

$x+y = 0.333\ldots = 1/3$

4. Convert the number $0.752727272727\ldots = 0.75\overline{27}$ to a fraction (doesn't need to be in lowest terms). Show your work and don't just use trial and error. [4]

$0.75\overline{27} = 0.75 + 0.00\overline{27}$

$0.75 = \frac{3}{4}$

$.\overline{27} = \frac{27}{99} = \frac{9(3)}{9(11)} = \frac{3}{11} \rightarrow .00\overline{27} = \frac{3}{1100}$

$\frac{3}{4} + \frac{3}{1100} = \frac{3 \times 275}{4 \times 275} + \frac{3}{1100}$

$= \frac{825+3}{1100} = \frac{828}{1100} = \frac{414}{550} = \frac{207}{275}$