Rational Numbers

Problems about Rational Numbers.
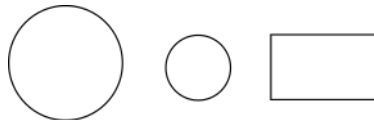
Problem 1 *Describe the set of rational numbers. Give some relevant and revealing examples/nonexamples.*

Problem 2 *What algebraic properties do the rational numbers enjoy that the integers do not? Explain your reasoning.*

Problem 3 *What number gives the same result when added to 1/2 as when multiplied by 1/2. Explain your reasoning.*

Problem 4 *Draw a rectangle to represent a garden. Shade in 3/5 of the garden. Without changing the shading, show why 3/5 of the garden is the same as 12/20 of the garden. Explain your reasoning.*

Problem 5 *Shade in 2/3 of the entire picture below:*

Explain your reasoning.

Problem 6 *What fractions could the following picture be illustrating?*

Explain your reasoning.

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Problem 7 *When Jesse was asked what the 7 in the fraction $\frac{3}{7}$ means, Jesse said that the "7" is the whole. Explain why this is not completely correct. What is a better description of what the "7" in the fraction $\frac{3}{7}$ means?*