Rational Numbers

Problems about Rational Numbers.

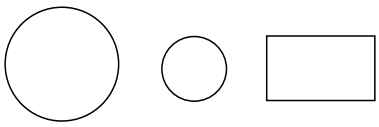
Problem 1 *Describe the set of rational numbers. Give some relevant and revealing examples/nonexamples.*

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.*

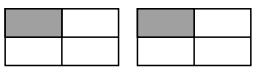
Problem 4 *Draw a rectangle to represent a garden. Shade in* $3/5$ *of the garden. Without changing the shading, show why* $3/5$ *of the garden is the same as* $12/20$ *of the garden. Explain your reasoning.*

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.

Learning outcomes:
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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?*