

Grade 7 Math – Art of Problem Solving**4.2 Solving Equations Using Multiplication or Division**

Work in class. Show reasoning, examples, or diagrams that support your conclusions.

REASON ABOUT SOLUTIONS

1. Same solution? Which equations have the same solution as $-\frac{3}{4}u = 6$? Explain each decision.

A. $-\frac{3}{2}u = 12$

B. $\frac{u}{-4} = 2$

C. $\frac{3}{4}u = 6$

D. $6 = -\frac{3}{4}u$

2. Two descriptions. A number z satisfies both $az = 15$ and $\frac{z}{b} = -2$. If $z = -6$, find a and b . Check both equations.

3. Repeated change. A research vessel changes elevation by -1.8 meters per minute for a constant number of minutes. Its total change is -13.5 meters. Write an equation for the elapsed time and interpret your answer.

Grade 7 Math – Art of Problem Solving**4.2 Solving Equations Using Multiplication or Division (Continued)**

Work in class. Show reasoning, examples, or diagrams that support your conclusions.

DEEPEN THE REASONING

- 4. A missing restriction.** For $ax = b$, explain why $x = \frac{b}{a}$ requires $a \neq 0$. What happens when $a = 0$ and $b = 0$? What happens when $a = 0$ and $b = 5$?

- 5. Scaling the coefficient.** If $kx = 18$ has solution $x = 6$, what is the solution of $2kx = 18$? Explain without first finding k .

- 6. Fraction challenge.** Choose different digits from 2, 3, and 6 for p and q in $\frac{p}{q}x = -12$. Make x as small as possible. Explain why your choice is optimal.
