Modelling and Solving Two-Step Equations: $\frac{x}{a} + b = c$

MathLinks 8, pages 388–393

Key Ideas Review
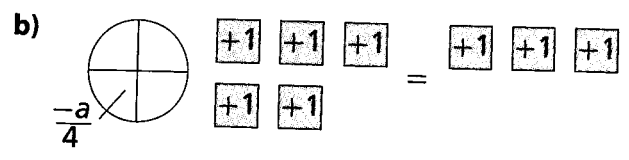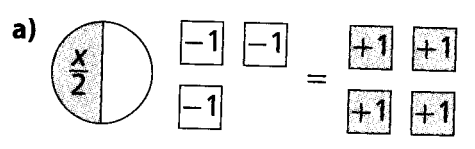
Choose from the following terms to complete #1.

add   divide   isolate   reverse   substituting   value

1. a) To solve an equation, ... the variable on one side of the equal sign.

   b) When undoing the operations performed on the variable, follow the

   .... order of operations.

   • subtract and/or ....

   • multiply and/or ....

   c) One method you can use to check your answer is .... it back into the equation. Both sides should have the same

   ....

Practise and Apply

2. Solve the equation modelled by each diagram. Check your solution.

   a) $\frac{x}{2}$ $\boxed{-1}$ $\boxed{-1}$ $=$ $\boxed{+1}$ $\boxed{+1}$
   $\boxed{-1}$ $\boxed{+1}$ $\boxed{+1}$

   b) $\frac{-a}{4}$ $\boxed{+1}$ $\boxed{+1}$ $\boxed{+1}$ $=$ $\boxed{+1}$ $\boxed{+1}$ $\boxed{+1}$
   $\boxed{+1}$ $\boxed{+1}$

3. Draw a model for each equation, and then solve. Verify your answer.

   a) $\frac{x}{-5} + 6 = 4$ b) $-5 + \frac{y}{3} = -3$

   c) $2 = 14 + \frac{n}{3}$ d) $16 = 9 + \frac{c}{-7}$

4. What are the first and second operations you should perform to solve each equation?

a) $\frac{f}{6} + 2 = -4$　　**b)** $\frac{r}{-3} - 6 = 7$

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c) $12 = 7 + \frac{z}{-5}$　**d)** $\frac{k}{11} - 12 = 6$

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5. Solve each equation.

a) $\frac{d}{-4} - 5 = -3$　**b)** $4 + \frac{n}{2} = 20$

**c)** $-6 = \frac{b}{-3} + 11$　**d)** $\frac{p}{13} - 2 = -3$

6. Show whether $h = 12$ is the solution to each equation.

a) $-6 = \frac{h}{-4} - 3$　**b)** $5 = 11 - \frac{h}{2}$

c) $\frac{-h}{12} + 8 = 9$　　**d)** $\frac{h}{3} - 1 = 3$

7. Rick saved $400 to buy a pair of skis. On Rick's birthday, his brother Jon gave him one eighth of his savings. Including the gift, Rick then had $475. Let j represents Jon's total savings. Write and solve an equation to determine Jon's savings before he gave Rick the gift.

8. In the following formula, f is the speed that a peregrine falcon can dive in km/h, and c is the speed of a cheetah in km/h: $\frac{f}{5} + 30 = c$. If the top speed of a cheetah is 100 km/h, how fast can a peregrine falcon dive? Show your thinking.
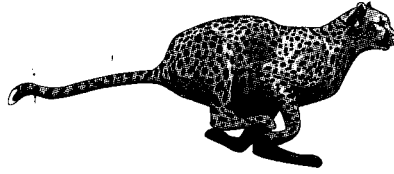
9. The discounted price of an airplane ticket is one third of the regular price, plus $137 in taxes and airport fees.

a) Write an equation to represent this situation.

b) If the discount ticket to Paris costs $349, what is the regular price?

c) If the regular ticket price to Vancouver is $699, what will a discount ticket cost?