Jig-Saw Problem - Circles

Jig Saw Instructions:

1. In a group of 4, each member will solve the problem on their page individually.
2. Join 3 or 4 other people with the same shape and work together to become "experts" on the provided problem.
3. Rejoin your original group and each person will have a turn explaining the solution to the problem that they are now an "expert" on.

Problem

American bison and North American elk are surprisingly fast. The sum of their top speeds is 104 km/h. The difference is 8 km/h. If the bison is the faster animal, what is its top speed? What is the top speed of the elk?

b = top speed of bison

e = top speed of elk

sum → $b + e = 104$

difference → $+ b - e = 8$

$2b = 112$

$\boxed{b = 56 \frac{km}{h}}$

$b - e = 8$

$(56) - e = 8$

$56 - 8 = e$

$\boxed{e = 48 \frac{km}{h}}$

The top speed of the bison is $56 \frac{km}{h}$ and the top speed of the elk is $48 \frac{km}{h}$.

Jig-Saw Problem - Triangles

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Problem

Daniel had 20 coins in his pocket, consisting of dimes and quarters. The total value of the coins was $2.75. How many of each type of coin did Daniel have?

d = # of dimes

q = # of quarters

# of coins → ① $d + q = 20$

value of coins → ② $0.10d + 0.25q = 2.75$

① ×10 $\quad 10d + 10q = 200$

② ×100 $\quad -10d + 25q = 275$

$-15q = -75$

$\boxed{q = 5}$

$d + q = 20$

$d + (5) = 20$

$\boxed{d = 15}$

Daniel had 15 dimes and 5 quarters.

Jig-Saw Problem - Squares

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Problem

A recycling company sells its recycling bins for $20 each. The fixed expenses to manufacture the bins total $4000. In addition, there is an expense of $12 per bin. How many recycling bins must the company sell in order to break even?

Break Even → Revenue = Expenses → $20x = 12x + 4000$

x = # of recycling bins

$8x = 4000$

$\boxed{x = 500}$

Revenue $= 20x$

Expenses $= 12x + 4000$

The company must sell 500 recycling bins to break even.

sketch

Jig-Saw Problem - Stars

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Problem

The operators of a national park want to be more water efficient. They decide to start with the park's comfort stations. First, they purchase one front-load washing machine and four shower heads for $900. Then, they purchase ten washers and eight shower heads for $8200. What is the cost of each washing machine? What is the cost of each shower head?

w = cost of washing machine

s = cost of shower head

First → ① $w + 4s = 900$

Then → ② $10w + 8s = 8200$

① × 2 $\quad 2w + \cancel{8s} = 1800$

② $\quad -10w + \cancel{8s} = 8200$

$-8w = -6400$

$\boxed{w = \$800}$

$w + 4s = 900$

$(800) + 4s = 900$

$4s = 100$

$\boxed{s = \$25}$

Washing machines cost $800 and shower heads $25.