SOLUTIONS TO PRACTICE TEST

1) Let x = speed of the plane
y = speed of the air

$2(x + y) = 600$
$2.5(x - y) = 600$ →

$x + y = 300$
$x - y = 240$
$2x = 540$
$x = 270$
$y = 30$

Final answer:
270 mph – plane's speed
30 mph - speed of the air

2) Let x = number of items worth 2 points
y = number of items worth 5 points

$x + y = 50$ x - 2
$2x + 5y = 145$ →

$-2x - 2y = -100$
$2x + 5y = 145$
$3y = 45$
$y = 15$
$x = 35$

Final answer:
15 – two-point items
35 – five-point items

3) Let x = amount of 20% alcohol solution
y = amount of 50% alcohol solution

$x + y = 9$ x - 2
$.2x + .5y = .3(9)$ x 10 →

$-2x - 2y = -18$
$2x + 5y = 27$
$3y = 9$
$y = 3$
$x = 6$

Final answer:
6 ounces of 20% alcohol
3 ounces of 50% alcohol

4) Let E – Emma's age now
O – Olivia's age now

$E = \frac{1}{2} O + 10$
$E + O = 31$

$\rightarrow$

$2E - O = 20$
$E + O = 31$
$3E = 51$
$E = 17$
$O = 14$

Final answer:
Emma's age now = 17 years
Olivia's age now = 14 years

5) Let S = number of cups the small pitcher can hold
L = number of cups the large pitcher can hold

$2S + L = 8$
$L - S = 2$ x 2

$\rightarrow$

$L + 2S = 8$
$2L - 2S = 4$
$3L = 12$
$L = 4$
$S = 2$

Final answer:
Small pitcher can hold 2 cups.
Large pitcher can hold 4 cups.

6) Let L = length of the rectangle
W = width of the rectangle

$2L + 2W = 54 \div 2$

$L + W = 27$

$W = \frac{1}{2} L$

$\rightarrow$

$-L + 2W = 0$
$3W = 27$
$W = 9$
$L = 18$

Final answer:
Length = 18 units
Width = 9 units

7) Let t = tens digit
u = units digit
10t + u = the original number
10u + t = the number with the digits interchanged or reversed

$$\begin{aligned} t + u &= 11 \\ 10u + t &= 10y + u - 45 \\ -\ 9t + 9u &= -45 \end{aligned}$$

$$\begin{aligned} t + u &= 11 \\ -t + u &= -5 \\ \hline 2u &= 6 \\ u &= 3 \\ t &= 8 \end{aligned}$$

Final answer: The number is 83.

8) Let x, y, z be the numbers.

$$\begin{aligned} x + y + z &= 14 \\ z &= 4x \\ x + 2z &= 18 \end{aligned}$$

Use substitution to solve for x:

$$\begin{aligned} x + 2(4x) &= 18 \\ 9x &= 18 \\ x &= 2 \end{aligned}$$

$$\begin{aligned} z &= 4(2) \\ z &= 8 \end{aligned}$$

$$\begin{aligned} 2 + y + 8 &= 14 \\ y &= 4 \end{aligned}$$

Final answer:
x = 2; y = 4; z = 8