

Research Honors Answer Key Mixture

1.

	items	value	quantity	total value
(24)	coffee A	6.50	x	6.5x
(16)	coffee B	9	40-x	9(40-x)

$$6.5x + 9(40-x) = 40(7.5)$$

$$6.5x + 360 - 9x = 300$$

$$-2.5x + 360 = 300$$

$$-2.5x = -60$$

$$x = 24$$

2.

	items	value	quantity	total value
(40)	candy A	12	x	12x
(30)	candy B	19	70-x	19(70-x)

$$12x + 19(70-x) = 15(70)$$

$$12x + 1330 - 19x = 1050$$

$$-7x + 1330 = 1050$$

$$-7x = -280$$

$$x = 40$$

3.

	items	value	quantity	total value
(12)	coffee A	3.20	x	3.20x
	coffee B	2.80	18	2.80(18)

$$3.20x + 2.80(18) = 2.96(18+x)$$

$$3.2x + 50.4 = 53.28 + 2.96x$$

$$.24x + 50.4 = 53.28$$

$$.24x = 2.88$$

$$x = 12$$

4.	items	value	quantity	total value
	2% alcohol solution	.02	5	.02(5)
	66% alcohol solution	.66	11	.66(11)

$x$  = concentration of new solution

$$.02(5) + .66(11) = x(16)$$

$$.1 + 7.26 = 16x$$

$$7.36 = 16x$$

$$.46 = x$$

$$x = 46\%$$

5.	items	value	quantity	total value
	45% nickel	.45	$x$	.45 $x$
	pure nickel	1	6	1(6)

$$.45x + 1(6) = (x+6) \cdot .78$$

$$.45x + 6 = .78x + 4.68$$

$$6 = .33x + 4.68$$

$$1.32 = .33x$$

$$x = 4$$