Money Problems

Sam has $10.65 made up of dimes and quarters. If there are 54 coins in all, how many dimes and quarters does he have?

To help solve this problem complete the chart below.

Number of Dimes	**Number** of Quarters	**Value** of Dimes (in cents)	**Value** of Quarters (in cents)	Total **Value**
53	1	$10\times53=530$	$25\times1=25$	555
52	2	$10\times52=520$	$25\times2=50$	$520+50=575$ ¢
33	$54-33=21$	$10\times33=330$	$25\times21=525$	$525+330=855$ ¢
d	$54-d$	$10\times d=10d$	$25(54-d)$	$10d+25(54-d)$
$54-q$	**q**	$10(54-q)$	$25q$	$10(540-q)+25q$

Use the information from the chart above to set up an equation and solve the problem.

Let "d" amount of dimes Sam has

dimes	quarters
d	$54-d$

In total Sam has \$10.65 ($10.65 \times 100 = 1065$ ¢)

$10d + 25(54-d) = 1065$

$10d + 1350 - 25d = 1065$

$1350 - 15d - 1350 = 1065 - 1350$

$\frac{-15d}{-15} = \frac{-285}{-15}$

$d = 19$

He has 19 dimes and $(54-19)=35$ quarters

In your notebooks, solve the following problems.

2. a) A bill of $2.35 was paid in dimes and nickels. If there were 32 coins in all, how many of each coin were there?

   b) The value of the dimes in a vending machine is $1.70 more than what it contains in quarters. If there are 199 coins in all, how many dimes and quarters are there?

   c) Jordan bought a radio for $120. He paid for it with $2 coins and $5 bills. If there were half as many coins as bills, how many $2 coins were there and how many $5 bills were there?

   d) Bob has $43.75 made up of $2 coins and quarters. If there are 22 more quarters than $2 coins, how many quarters are there?

   e) Ed has $8.50 in nickels and quarters. The number of nickels is 5 more than 6 times the number of quarters. How many nickels does he have?

   f) Terri has some dimes and nickels in her purse. She has four more dimes than nickels. The value of the nickels is $1.60 less than the value of the dimes. How many of each coin does she have?

Answers:

2. a) 17 nickels, 15 dimes b) 147 dimes, 52 quarters c) 10 $2, 20 $5
   d) 39 quarters e) 95 nickels f) 24 nickels, 28 dimes

2) a. Let "n" be the number of nickels

5¢ ← nickels	dimes → 10¢
n	32 − n

$5n + 10(32-n) = 235$

$5n + 320 - 10n = 235$

$320 - 5n - 320 = 235 - 320$

$\frac{-5n}{-5} = \frac{-85}{-5}$

$\boxed{n = 17}$

∴ There're 17 nickels and 15 dimes.

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b. Let "d" be the number of dimes

dimes	quarters
d	199 − d

Value of dimes	Value of quarters
10d	25(199 − d)

$10d = 25(199-d) + 170$

$10d = 4975 - 25d + 170$

$+25d + 10d = 5145 - 25d + 25d$

$\frac{35d}{35} = \frac{5145}{35}$

$\boxed{d = 147}$

There're 147 dimes and (199−147)52 qu.

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c. Let "b" the number of bills

$2 coins	$5 bills
$\frac{b}{2}$	b

$\frac{2}{1} \cdot \frac{b}{2} + 5b = 120$

$\frac{2b}{2} + 5b = 120$

$b + 5b = 120$

$\frac{6b}{6} = \frac{120}{6}$

$\boxed{b = 20}$

∴ There are 20 $5 bills and 10 $2 coins

d. Let "t" represent the number of toonies ($2 coins)

toonies	quarters
t	$t+22$

cents ↙ $200t + 25(t+22) = 4375$ ↙ cents

$200t + 25t + 550 = 4375$

$225t + 550 - 550 = 4375 - 550$

$\frac{225t}{225} = \frac{3825}{225}$

$\boxed{t = 17}$

∴ There are 17 toonies and 39 quarters.

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c. Let "q" be the number of quarters

quarters	nickels
q	$6q+5$

$25q + 5(6q+5) = 850$ ↙ cents

$25q + 30q + 25 = 850$

$55q + 25 - 25 = 850 - 25$

$\frac{55q}{55} = \frac{825}{55}$

$\boxed{q = 15}$

∴ There are $6(15)+5 = 95$ nickels.

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f. Let "n" be the number of nickels

nickels	dimes
n	$n+4$

value ↘ ↙ cents

$5n = 10(n+4) - 160$

$5n = 10n + 40 - 160$

$5n - 10n = 10n - 120 - 10n$

$\frac{-5n}{-5} = \frac{-120}{-5}$

$\boxed{n = 24}$

There're 24 nickels and 28 dimes.