Name: _____ Date: Dec 17 Hour: __Alg 1__

Unit 4 Day 13: Mixed Systems Practice

Focus Question: Can I solve a systems word problem using the most efficient method?

MAKE SMART CHOICES

ON YOUR OWN PAPER, solve each word problem. Remember to define your variables. ← what letters & what they stand for

1. A rectangle has a perimeter of 14 feet. Its length is equal to 1 less than 3 times its width. What is the area of the rectangle?

   10 ft²

2. Suppose you bought supplies for a party. Three rolls of streamers and 15 party hats cost $30. Later you bought 2 rolls of streamers and 4 party hats for $11. How much would it cost to buy 1 roll of streamers and 3 party hats? $7

3. Your teacher is giving you a test worth 100 points consisting of 40 questions. There are two point multiple choice questions and four-point open response questions. How many multiple choice questions are on the test? 30

4. The local pre-school ordered all new bicycles and tricycles of the new school year. Each bicycle and tricycle is shipped in its own box. Oddly, the manufacturer shipped all the wheels in a separate box. If there are 16 boxes of bicycles/tricycles total, and 45 wheels total, how many tricycles were ordered?

   13

5. An isosceles triangle has legs that are each x inches long and a base that is y inches long. The perimeter of the triangle is 37 inches. The base is 8 inches shorter than the length of a leg. What is the total length of the legs of 5 such triangles? 150 in

6. The sum of two numbers is 40. Their difference is 24. What is the smaller quotient of the two numbers? $\frac{1}{4}$

7. A McDonalds apple pie has 90 more calories than their chocolate chip cookie. Two apple pies and three chocolate chip cookies have a total of 980 calories. How many calories are in half an apple pie? 125

8. If $y = \frac{4}{3}x - 2$ and $y = -\frac{2}{3}x + 4$, then what is the value of xy? 6

9. Jack has a collection of new nickels and quarters. He has a total of 50 coins worth $10.30. How much money does he have just in nickels? 55¢

10. Quentin was challenged to a half-court shooting competition. For every half-court shot that he makes, he will earn 20 points. For each half-court shot he misses, he will lose 5 points. After 20 half-court shots, Quentin has zero points. How many half-court shots did he make? 4

Check #7

① sum of all sides

$P = 14$
$\ell = 3w - 1$
$A = ?$ $5 \cdot 2 = \boxed{10\ ft^2}$

P is perimeter
ℓ is length: 5 ft
W is width: 2 ft.
A is area

$\begin{cases} 2\ell + 2w = 14 \\ 2(3w-1) + 2w = 14 \end{cases}$ & $\ell = 3w - 1$

smart choice substitution b/c ℓ is already isolated

$6w - 2 + 2w = 14$
$8w - 2 = 14$
$+2 \quad +2$
$\frac{8w}{8} = \frac{16}{8}$
$w = 2$

$\ell = 3(2) - 1$
$\ell = 6 - 1$
$\ell = 5$

② s: cost of streamers: $2.50
h: cost of party hat: $1.50

$2(3s + 5h) = 30 \cdot 2 \rightarrow 6s + 30h = 60$
$3(2s + 4h) = 11 \cdot 3 \rightarrow 6s + 12h = 33$

$2s + 4(1.50) = 11$
$2s + 6 = 11$
$-6 \quad -6$
$\frac{2s}{2} = \frac{5}{2}$
$s = \$2.50$

$\frac{18h}{18} = \frac{27}{18}$
$h = \$1.50$

? $1s + 3h = ?$
$2.50 + 4.50 = \boxed{\$7}$

(3) m: # of multiple choice
θ: # of open response

m = ?

$4(m+\theta)=(40)4 \rightarrow 4m+4\theta=160$ Smart choice eliminate the θ

$2m+4\theta=100$ copy

$2m+4\theta=100$

$\frac{2m}{2}=\frac{60}{2}$

$\boxed{m=30}$

(4) b: # of bikes
t: # of tricycles

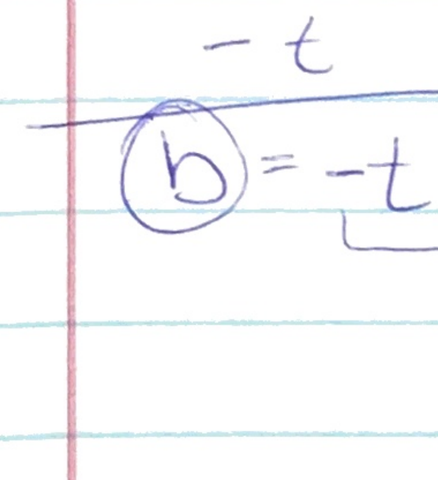
t = ?

① Subst. isolate b
② Eliminate b

$b+t=16$
$-t \quad -t$
$b=-t+16$

$b+3t=45$
$2(-t+16)+3t=45$
$-2t+32+3t=45$
$t+32=45$
$-32 \quad -32$
$\boxed{t=13}$

(5) isosceles Δ



$2x+y=37$
$2x+x-8=37$
$3x-8=37$
$+8 \quad +8$
$\frac{3x}{3}=\frac{45}{3}$
$x=15$

$y=x-8$

2 legs, 5 Δ's = 10 leg

15 • 10

$\boxed{150 \text{ inches}}$

(8) $y = 4/3x - 2$

$y = -2/3x + 4$

$y = \frac{4}{3}(3) - 2$

$y = 4 - 2$

$y = 2$

$xy = ?$

$3 \cdot 2 = 6$

$\frac{4}{3}x - 2 = -\frac{2}{3}x + 4$

$+\frac{2}{3}x \quad +\frac{2}{3}x$

$2x - 2 = 4$

$+2 \quad +2$

$\frac{2x}{2} = \frac{6}{2}$

$x = 3$

(6) $x + y = 40$

$-(x - y = 24)$

$2y = 16$

$y = 8$ so $x + 8 = 40$

$x = 32$

$\frac{32}{8} = 4 \qquad \frac{8}{32} = \frac{1}{4}$

(7) $a = c + 90$

$2a + 3c = 980$

$\frac{1}{2}a = ?$

125

$2(c + 90) + 3c = 980$

$2c + 180 + 3c = 980$

$5c = 800$

$c = 160$

$a = 160 + 90$

$a = 250$

(9) $n + q = 50$

$4(.05n + .25q = 10.30)$

$n + q = 50$

$-(.2n + q = 41.2)$

$\frac{.8n}{.8} = \frac{8.8}{.8}$

$n = 11$

11 nickels = 55¢

(10) $(m + n = 20).5$

$20m - 5n = 0$

$+ 5m + 5n = 100$

$25m = 100$

$m = 4$