Minitest 4A - MTH 2010

Dr. Graham-Squire, Fall 2014

10:34
10:48
14
⇒ 40 minutes

Name: Key

I pledge that I have neither given nor received any unauthorized assistance on this exam.

_____

(*signature*)

DIRECTIONS

1. Show all of your work, even on the multiple choice questions. A correct answer with insufficient work or incorrect notation will lose points.
2. Clearly indicate your answer by putting a box around it.
3. Calculators, cell phones and computers are <u>not</u> allowed on this test.
4. Make sure you sign the pledge.
5. Number of questions = 6. Total Points = 25.

1. (3 points)

(a) Jane gets an allowance of \$3 per week from her parents. After 4 weeks have passed, her uncle gives her 8 dollars, and then she spends 2 dollars on a plastic cow. How much money does Jane have left?

$3 \cdot 4 + 8 - 2$

$= 12 + 6 = \boxed{\$18}$

(b) Translate the sentence into an equation: "During a football game, the Seahawks scored 8 points less than five times the number of points scored by the Raiders." Use S to represent the number of points scored by the Seahawks and R to represent the number of points scored by the Raiders.

$\boxed{S = 5R - 8}$

(c) Write an expression, in terms of N, to represent the Nth number in the sequence

$$2, 9, 16, 23, 30, 37, \ldots$$

Thus if you substitute $3{=}N$ into your expression, it should give you the result of 16.

Increase by 7 each time $\Rightarrow 7N$

when $N = 1$, should get 2

So $7(1) - 5 = 2$

$\Rightarrow \boxed{7N - 5}$ is the expression.

Check: $N = 3$

$7(3) - 5$

$= 21 - 5$

$= 16$ ✓

2. (5 points) There are 1500 troll dolls arranged into 4 groups. The second group has twice as many dolls as the first group. The third group has 20 more dolls than the second group. The fourth group has twice as many dolls as the third group. How many troll dolls are in each group?

1st group	2nd	3rd	4th
N ✓	$2N$ ✓	$2N+20$ ✓	$2(2N+20)$ ✓

$N + 2N + 2N+20 + 2(2N+20) = 1500$ ✓✓

$5N + 20 + 4N + 40 = 1500$ ✓

$9N + 60 = 1500$

$9N = 1500 - 60$

$N = \frac{1440}{9}$

$N = 160$ ✓

⇒

1st group: 160 ✓

2nd: 320

3rd: 340 ✓

4th: 680

3. (4 points) There are R pounds of rice in a bag. First, $\frac{3}{8}$ of the rice in the bag is removed. Next, 4 pounds of rice is added to the bag. Then $\frac{1}{3}$ of the bag is poured into a bucket. Lastly, $\frac{3}{4}$ of a pound of rice is removed from the bucket. Write an expression, in terms of R, that represents how much rice is in the bucket.

initially: R pounds in bag

then: $R - \frac{3}{8}R$ in bag ✓

Next: $R - \frac{3}{8}R + 4$ in bag ✓

Then $\frac{1}{3}\left(R - \frac{3}{8}R + 4\right)$ in bucket ✓

Lastly $\boxed{\frac{1}{3}\left(R - \frac{3}{8}R + 4\right) - \frac{3}{4}}$ ✓ in bucket

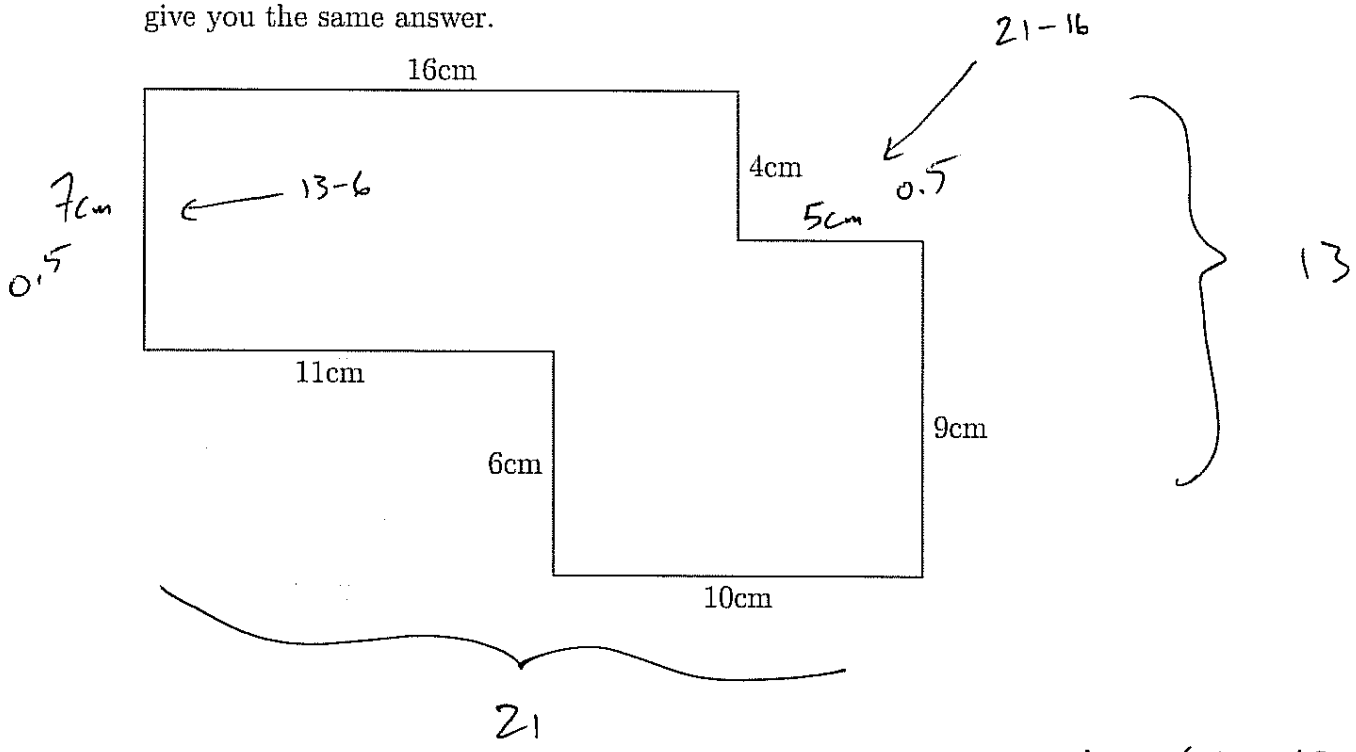
or $\frac{1}{3}\left(\frac{5}{8}R + 4\right) - \frac{3}{4}$

or $\frac{5}{24}R + \frac{4}{3} - \frac{3}{4}$ $\quad \frac{16}{12} - \frac{9}{12}$

or $\frac{5}{24}R + \frac{7}{12}$ pounds in bucket.

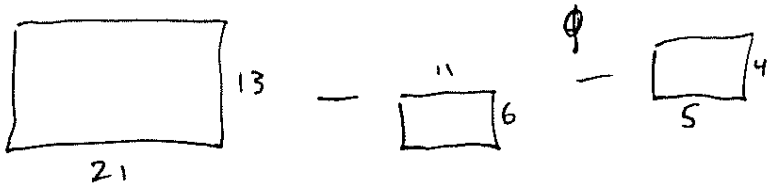
4. (5 points) (a) Calculate the perimeter of the shape below.

(b) Write two different expressions that could be used to find the area of the shape, and explain your reasoning for both. Calculate the two expressions to show that they give you the same answer.



(a) Perimeter = $7+11+6+10+9+5+4+16 = 2(21)+2(13) = 68\text{ cm}$ ✓

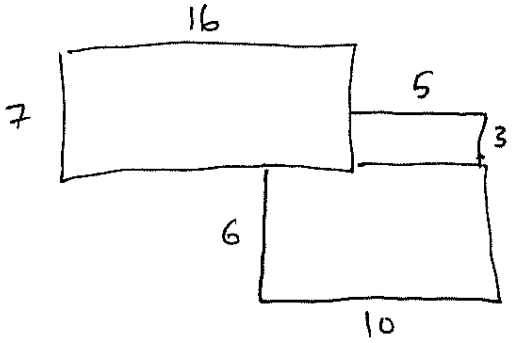
(b) Could do



$= 21(13) - 6(11) - 5(4) = 273 - 66 - 20 = 187\text{ cm}^2$ ✓

This is the big rectangle minus the two small rectangles.

Or

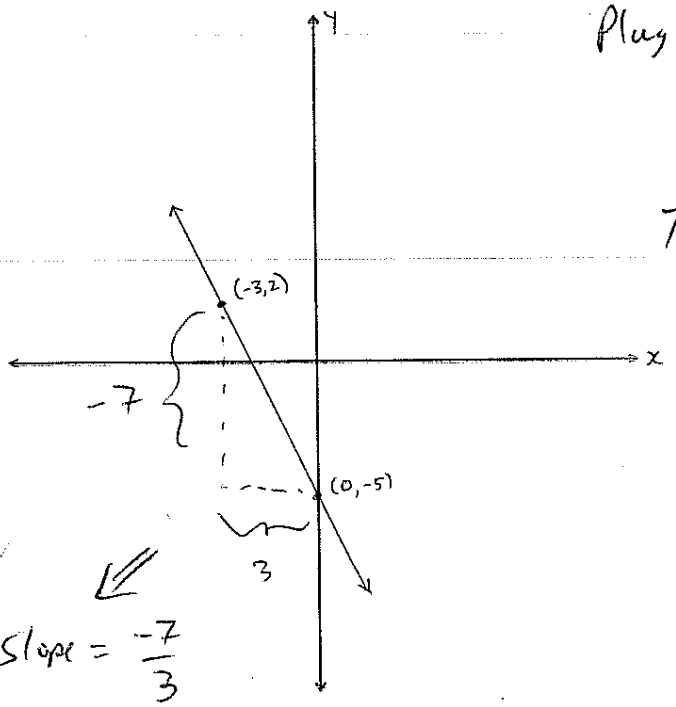


Cut into 3 rectangles

$= 7(16)+6(10)+3(5)$

$= 112+60+15 = 187\text{cm}^2$ ✓

5. (4 points) The graph of the line below represents the equation $Mx + 3y = -15$. What is the value of M?



Plug in (-3,2)
(x, y)

To get

$M(-3) + 3(2) = -15$

$-3M + 6 = -15$

$-3M = -15 - 6$ ✓

$\frac{-3M}{-3} = \frac{-21}{-3}$ ✓

$M = 7$

Slope $= \frac{-7}{3}$ ✓

(A) -6

(B) -3

(C) 5

(D) 7 ✓✓

Or ~~M~~ = slope

$3y = -15 - Mx$

$y = -\frac{M}{3}x - 5$ ✓

$-\frac{M}{3} = \frac{-7}{3}$

$\Rightarrow M = 7$

6. (4 points) The website www.artsyweasel.com sells original paintings. For each painting sold, the website collects a flat fee of \$8, plus 20% of the sale price of each painting sold, with the remaining money going to the painter. All paintings cost \$10 or more. If Q represents the sale price of one item, which expression below represents the amount of money the painter gets for each painting sold?

(A) $\frac{Q}{5} - 8$

(B) $\frac{4Q}{5} - 8$ ✓✓

(C) $\frac{4Q}{5} + 8$

(D) $\frac{Q}{5} + 8$

20% of $Q = \frac{1}{5}$ of $Q = \frac{Q}{5}$

So $\frac{Q}{5}$ goes to website ⇒ ✓

$Q - \frac{Q}{5} = \frac{4Q}{5}$ goes to painter

Then subtract another \$8 from the painters earnings to get

$\frac{4Q}{5} - 8$ ✓

−1 if no work

check: for a \$20 painting, 20% of 20 = \$4,

So $4+8 = 12$ goes to website ⇒ \$8 to painter,

and $\frac{4(20)}{5} - 8 = \frac{80}{5} - 8 = 16 - 8 = 8$ ✓

Extra Credit(1 point) Find the 80th term in the sequence:

$1, 3, 6, 10, 15, 21, 28, \ldots$ (+2, +3, +4)

4th term is $1+2+3+4$

⇒ 80th term is $1+2+3+4+\cdots+78+79+80 = N$

$80+79+78+\cdots+3+2+1 = N$

$81+81+\cdots+81+81 = 2N$ (80 times)

$80 \cdot 81 = 2N \Rightarrow N = \frac{80}{2} \cdot 81 = 40 \cdot 81$

$= \boxed{3240}$