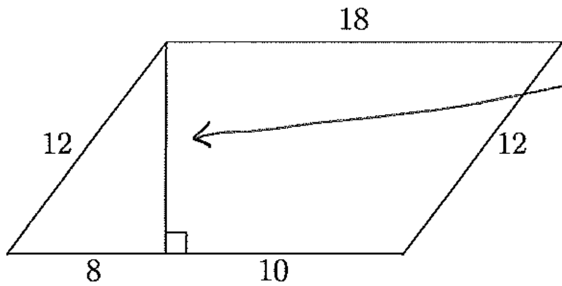
Key

$\frac{5.5}{5}$

Math 118 - Dr. Miller - Quiz #4: Areas of Polygons - **Due Wednesday, 02/12/14**

.5
BONUS 1. Find the area of the figure below. Show work; round to the nearest tenth.



h is missing:

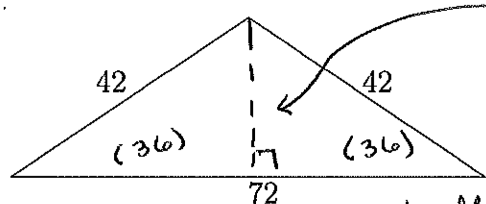
$$8^2 + h^2 = 12^2$$
$$64 + h^2 = 144$$
$$h^2 = 80$$
$$h = \sqrt{80}$$
$$h = 8.9$$

$$A = bh$$
$$= (18)(8.9)$$
$$\boxed{= 160.2}$$

(no units involved)

1

2. Find the area of the figure below. Show work; round to the nearest tenth.



base split in half in isos. Δ.

h missing again:

$$36^2 + h^2 = 42^2$$
$$1296 + h^2 = 1764$$
$$h^2 = 468$$
$$h = \sqrt{468}$$
$$h = 21.6$$

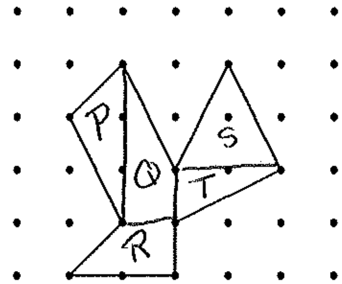
$$A = \frac{1}{2}bh$$
$$= \frac{1}{2}(72)(21.6)$$
$$\boxed{= 777.6}$$

(no units involved

2.5

(1/2) each error

3. Find the area of the figure below. Show work; round to the nearest tenth.



An additive approach:

$$\text{Total area} = \underset{(\text{tri})}{P} + \underset{(\text{trap})}{Q} + \underset{(\text{trap})}{R} + \underset{(\text{tri})}{S} + \underset{(\text{tri})}{T}$$

$$= 1.5 + 2 + 1.5 + 2 + 1$$

$$\boxed{= 8}$$

P: $A = \frac{1}{2}bh$
$= \frac{1}{2}(3)(1)$
$= 1.5$

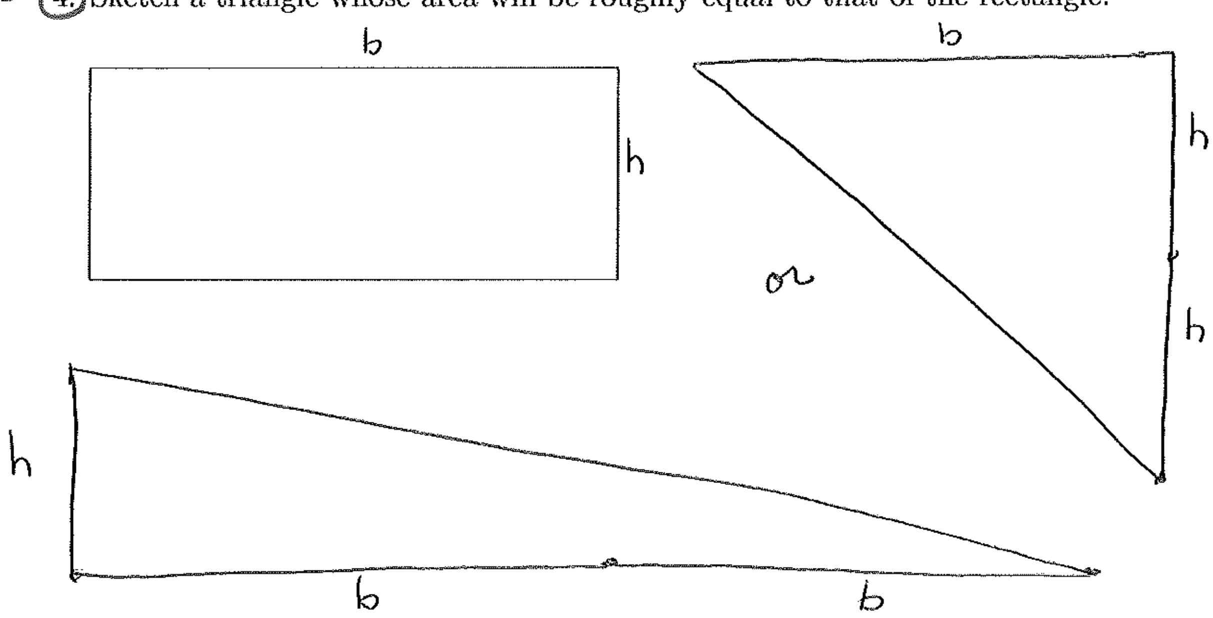
S: $A = \frac{1}{2}bh$
$= \frac{1}{2}(2)(2)$
$= 2$

Q: $A = \frac{1}{2}(b_1 + b_2)h$
$= \frac{1}{2}(3+1)\cdot 1$
$= 2$

T: $A = \frac{1}{2}bh$
$= \frac{1}{2}(1)(2)$
$= 1$

R: $A = \frac{1}{2}(b_1 + b_2)h$
$= \frac{1}{2}(2+1)\cdot 1$
$= 1.5$

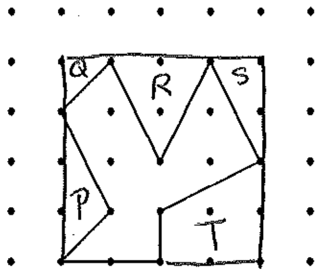
.5 4. Sketch a triangle whose area will be roughly equal to that of the rectangle.



(2.5)

½ each error

3. Find the area of the figure below. Show work; round to the nearest tenth.



A subtractive approach:

Total area = enclosing grid − P (tri) − Q (tri) − R (tri) − S (tri) − T (trap.)

$= 16 - 1.5 - .5 - 2 - 1 - 3$

$\boxed{= 8}$

Don't need whole 5×6 grid, just 4×4 part enclosing shape : $A = 16$

P: $A = \frac{1}{2}bh$
$= \frac{1}{2}(3)(1)$
$= 1.5$

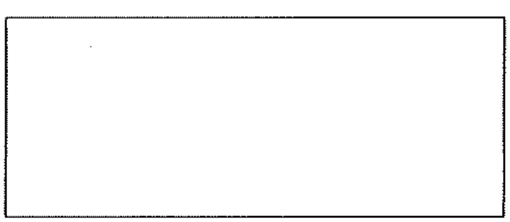
R: $A = \frac{1}{2}bh$
$= \frac{1}{2}(2)(2)$
$= 2$

T: $A = \frac{1}{2}(b_1+b_2)h$
$= \frac{1}{2}(1+2)\cdot 2$
$= 3$

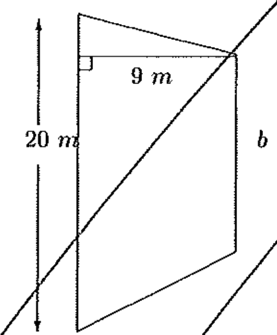
Q: $A = \frac{1}{2}bh$
$= \frac{1}{2}(1)(1)$
$= .5$

S: $A = \frac{1}{2}bh$
$= \frac{1}{2}(1)(2)$
$= 1$

4. Sketch a triangle whose area will be roughly equal to that of the rectangle.



5. Show work in finding the missing value, to the nearest tenth: $A = 240\ m^2$, b=??



OMIT

#3 1

6. If the height of a triangle triples but its base is cut in half, what is the nature and amount of the change in its area? Support your claim with two comparisons.

#1: $h=1$ + $b=4$ $\qquad A=\frac{1}{2}\cdot 1\cdot 4 = 2$

$h=3$ + $b=2$ $\qquad A=\frac{1}{2}\cdot 3\cdot 2 = 3$

New A vs. old A:

$3-2=1$ more added

or $3\div 2 = 1.5$ times more

#2 $h=10$ + $b=4$ $\qquad A=\frac{1}{2}\cdot 10\cdot 4 = 20$

$h=30$ + $b=2$ $\qquad A=\frac{1}{2}\cdot 30\cdot 2 = 30$

New A vs. old A:

$30-20=10$ more added (not like #1)

$30\div 20 = 1.5$ times more (agrees w/ #1)

The area gets 1.5 times bigger whenever these changes happen.