Foundations Math 11

Page 31 #4-10, 13

4. Prove sum of two even integers is always even.

Let the two even numbers be $2x$ and $2y$

$$2x+2y = 2(x+y)$$

Since $2(x+y)$ is divisible by 2, it is even

5. Prove that the product of an even integer and odd integer is always even.

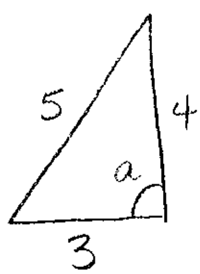
Let the even number be $2m$ and the odd be $2n+1$

product: $2m(2n+1) = 4mn+2m$

$= 2m(2n+1)$

Since $2m(2n+1)$ is divisible by 2, it is even

6. Prove ∠'s a, b, and c are equal.



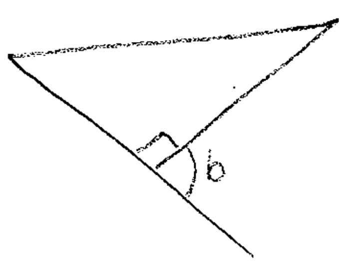
Pythagorean theorem will work if $\angle a = 90°$

$3^2+4^2 = 5^2$

$9+16 = 25$

$25 = 25$

$\angle a = 90°$



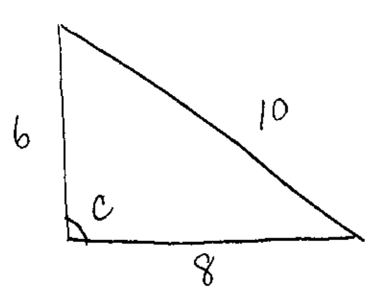
The square box in the angle in the triangle indicates that it is 90°

the 90° and ∠b are supplementary

so: $90 + \angle b = 180$

$\angle b = 180 - 90$

$\angle b = 90°$



Use Pythagorean theorem again

$6^2+8^2 = 10^2$

$36+64 = 100$

$100 = 100$

$\angle c = 90°$

∠a, ∠b, and ∠c are all equal.

page 31 cont.

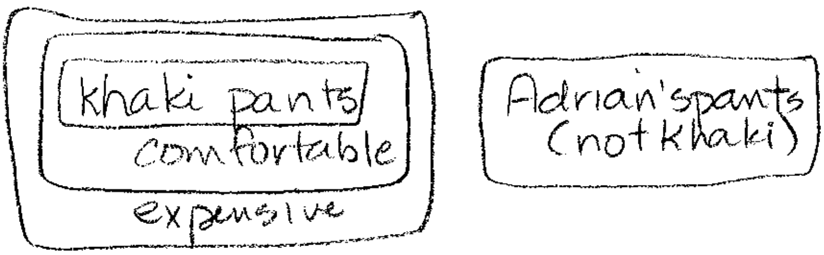
7. a) inductively

	n = 3	n = 7	n = -2
x 4	12	28	-8
+10	22	38	2
÷2	11	19	1
- 5	6	14	-4
÷2	3	7	-2
+ 3	6	10	1

b)

	$n = t$
x 4	$4t$
+10	$4t+10$
÷2	$2t+5$
- 5	$2t$
÷2	t
+ 3	$t+3$

8.



Adrian's pants are not khaki but we don't know if "not khaki" means expensive or not expensive. We only know that khaki is expensive

9.

	n
double	$2n$
+ 6	$2n+6$
double	$4n+12$
− 4	$4n+8$
÷ 4	$n+2$
−2	n

10. $2n+1$ is odd

square it: $(2n+1)^2 =$

$(2n+1)(2n+1) =$

$4n^2+2n+2n+1 =$

$4n^2+4n+1$

$4n^2$ and $4n$ are both divisible by 2 so they are even

+1 means $4n^2+4n+1$ is odd

13. A four digit number is abcd

a is thousands, b is hundreds, c is tens and d is ones so:

abcd = $1000a + 100b + 10c + d$

$1000a$, $100b$, and $10c$ are all divisible by 2 so they are even

abcd will be even if d is even, meaning it is divisible by 2.