

4.1

- 1) a) Is -17 an odd INT
yes, $-17 = 2(-9) + 1$
b) Is 0 an even INT
yes, $0 = 2 \cdot 0$
c) Is $2k-1$ odd
yes, $2k-1 = 2(k-1) + 1$

11) Counter Example

For all real numbers a and b , if $a < b$ then $a^2 < b^2$
Let $a = -2$ and $b = -1$ $a^2 \not< b^2$

24) The neg of any even number is even
 $-n = -(2k) = 2(-k)$ Let $r = -k$
 $r = -k = (-1)k$, product of two INT is an INT

35) There exist an INT $m \geq 3$ such that $m^2 - 1$ is prime
For all INT $m \geq 3$, $m^2 - 1$ is not prime
 $m^2 - 1$ is a product of two smaller positive
INT, each > 1

4.2

4)

$$37373737 = x$$

$$100x = 3737373737$$

$$99x = 37$$

$$\frac{37}{99}$$

13) The neg of any rational number is rational

A) \forall real numbers r , if r is rational, then $-r$ is rational

b) True; $r = a/b$, both a and $b \neq 0$