Re: ranges of integer polynomials

Source: http://sci.tech−archive.net/Archive/sci.math/2007−10/msg01264.html

---

- *From*: quasi <quasi@xxxxxxxx>

- *Date*: Sun, 07 Oct 2007 01:02:19 −0400

Just to give an update ...

Of the 12 problems I posed in this thread, 3 of them −− problems 1, 6, 8, have now been resolved.

There are 9 problems still left from the original group, and I believe that they are all within reach.

For reference, here are the problems not yet resolved:

Let f be an integer polynomial, possibly multivariate, and let range(f) denote the range of f for all integer inputs.

problem (2):

Can range(f) = {x^2 | x in Z} union {−x^2 | x in Z} ?

problem (3):

(a) Can range(f) = {x^2 | x in Z} union {2x | x in Z} ?

(b) Can range(f) = {x^2 | x in Z} union {2x | x in N} ?

problem (4):

(a) Can range(f) = {x^2 | x in Z} union {x^3 | x in Z} ?

(b) Can range(f) = {x^2 | x in Z} union {x^3 | x in N} ?

problem (5):

Must at least one of the sets

(range(f) intersect N)

(range(−f) intersect N)

have a density, as a subset of N?

problem (7):

If range(f) is a subset of N, must range(f) have a density, as a
subset of N?

problem (9):

(a) Can range(f) be the set of all integer non−cubes?

(b) Can range(f) be the set of all positive integer non−cubes?

problem (10):

(a) For which positive integers k>2, if any, can the set of all
integer non−k'th powers be realized as range(f)?

(b) For which positive integers k>2, if any, can the set of all
positive integer non−k'th powers be realized as range(f)?

problem (11):

Can range(f) = the set of squarefree positive integers?

problem (12):

(a) If f is not constant and range(f) contains zero as a least
element, must there exist an integer polynomial g such that range(g) =
range(f) \ {0} ?

(b) If f is not constant and range(f) is a subset of N, must there
exist an integer polynomial g such that range(g) = range(f) union {0}
?

quasi
.