

## Examples on Mathematical Induction: divisibility 10

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1. Given  $a = \frac{1}{2}(3 + \sqrt{13})$ ,  $b = \frac{1}{2}(3 - \sqrt{13})$ , and  $f(x) = \frac{(a^x - b^x)}{\sqrt{13}}$ . Prove that  $f(3n)$  is divisible by 10 for all natural numbers  $n$ .