





September 3, 2013

You may use your hand-written Notebooks but no other materials and no technology at all.

1. Determine whether each of the following is true (T) or false (F).

- T  F Every integer is a rational number.  $n = \frac{n}{1}$
- T  F  $1.5 \in \{x \in \mathbb{R} \mid x - 2 > 0\}$   $1.5 - 2 > 0?$  No
- T  F  $\{x \mid 0 < \text{dist}(3, x) < 2\} = (1, 3) \cup (3, 5)$  
- T  F  $11.9999\bar{9} = 12$  
- T  F  $(-\infty, 5) \cup [0, \infty) = \mathbb{R}$  
- T  F  $[-1, 3) \cap (-\infty, -2) = (-2, -1]$  
- T  F If  $a$  and  $b$  are rational numbers then so is  $a + b$ .
- T  F If  $a$  and  $b$  are rational numbers then so is  $\frac{a}{b}$ . if  $b = 0$  ;)
- T  F If  $\frac{A}{B} = 0$  then  $A = 0$  or  $B = 0$ . need  $B \neq 0$
- T  F For all  $x \in \mathbb{R}$  we have  $\frac{(x+1)(x+2)}{x+1} = x+2$ . not for  $x = -1$
- T  F The equation  $x^2 + 2x - 7 = 0$  has no real number solutions.  $b^2 - 4ac = 4 + 28 > 0$
- T  F The equation  $16x^4 - 81 = 0$  has exactly four real number solutions.  $(4x^2 + 9)(4x^2 - 9)$   
irred.  $(2x - 3)(2x + 3)$
- T  F  $a^3 - b^3 = (a - b)(a^2 + ab + b^2)$
- T  F  $\frac{1}{\frac{1}{x} + \frac{1}{y}} = x + y$   $\frac{1}{\frac{1}{2} + \frac{1}{3}} = \frac{5}{5}$  no
- T  F When a function  $f$  is positive, the graph of its derivative  $f'$  is increasing.  $f'$   $f$
- T  F The instantaneous rate of change of a function  $f$  at a point  $x = a$  can be represented as the slope of a secant line.
- T  F When a function  $f$  has a steep slope at a point on its graph, its instantaneous rate of change at that point will have a large magnitude.
- T  F Three is the best number.