



Philadelphia University
Department of Basic Sciences and Mathematics



Academic Year:	2017–2018	Course Name:	Mathematica
Semester:	Second Semester	Course Number:	250372
Exam:	Second Exam	Instructor:	Feras Awad
Exam Date:	30/04/2018	Student Name:	_____
Exam Day:	Monday	University ID:	_____
Mark:	[20]	Section:	_____

Answer all the following questions using *Mathematica*.

1. Factor the 36th Fibonacci number.

2. How many digits are there for $125!$?

3. What is the 5th prime next to the number 5179532 ?

4. Find the quotient and the remainder when we divide 2018 by 304.

5. Find the least common multiple for the numbers 11, 942, 173.

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6. From the first 5000 prime numbers, **how many** of them will be prime if we **reverse** its digits ?

7. **Solve the inequality** $e^{x^2-1} + x \geq \ln(x+1)$.

8. The equation $x+1 = \sin x$ has **real root** in the interval $[0,2]$, **find** this root.

9. **Decompose** $\frac{2x^3 - 9x^2 + 10x - 27}{x^4 + x^3 + 5x^2 + 7x - 14}$ into a sum of **partial fractions**.

10. Find the **integer solution** of the system $\begin{cases} x - 2y^2 = 5 \\ x + y = 8 \end{cases}$.
