# Homework: Math for Developers

## Some Primes

Find the 24th, 101st and 251st prime number.

Answer: 89, 547 and 1597.

## Some Fibonacci Primes

Check if the 24th, 101st and 251st prime numbers are part of the base Fibonacci number set. What is their position?

Answer: If Fibonacci number set begins from 0 (0, 1, 1, 2, 3, 5, 8, 13, 21, 34, 55,…)

24th → 12th position;

101st → is not part of the Fibonacci number set;

251st → 18th position.

## Some Factorials

Find 100!, 171! and 250! Give all digits.

Answer:

100! = 1.2.3………….99.100 = 93326215443944152681699238856266700490715968264381621468592963895217599993229915608941463976156518286253697920827223758251185210916864000000000000000000000000

171! = 1.2.3………….170.171 = 1241018070217667823424840524103103992616605577501693185388951803611996075221691752992751978120487585576464959501670387052809889858690710767331242032218484364310473577889968548278290754541561964852153468318044293239598173696899657235903947616152278558180061176365108428800000000000000000000000000000000000000000

250! = 1.2.3………….249.250 = 3232856260909107732320814552024368470994843717673780666747942427112823747555111209488817915371028199450928507353189432926730931712808990822791030279071281921676527240189264733218041186261006832925365133678939089569935713530175040513178760077247933065402339006164825552248819436572586057399222641254832982204849137721776650641276858807153128978777672951913990844377478702589172973255150283241787320658188482062478582659808848825548800000000000000000000000000000000000000000000000000000000000000

## Calculate Hypotenuse

You are given three right angled triangles. Find the length of their hypotenuses.

1. Catheti: 3 and 4 → Hypotenuse = (32 + 42 ) ½ = 5
2. Catheti: 10 and 12 → Hypotenuse = (102 + 122 ) ½ ≈ 15.62
3. Catheti 100 and 250 → Hypotenuse = (1002 + 2502 ) ½ ≈ 269.26

## Numeral System Conversions

Convert 1234d to binary and hexadecimal numeral systems.

1. To binary numeral system

1234 / 2 = 617 0

617 / 2 = 308 1

308 / 2 = 154 0

154 / 2 = 77 0

77 / 2 = 38 1

38 / 2 = 19 0

19 / 2 = 9 1

9 / 2 = 4 1

4 / 2 = 2 0

2 / 2 = 1 0

1 / 2 = 617 1 ⇒ 1234d = 10011010010b

1. To hexadecimal numeral system

1234 / 16 = 77 2

77 / 16 = 4 13 → D

4 / 16 = 0 4 ⇒ 1234d = 4D2hex

Convert 1100101b to decimal and hexadecimal numeral systems.

* 1. To decimal numeral system

1100101b = 1.26 + 1.25 + 0.24 + 0.23 + 1.22 + 0.21 + 1.20 = 101

⇒ 1234b = 101d

* 1. To hexadecimal numeral system

1. 0101b

* ↓

1.22 + 1.21 + 0.20 = 6 0.23 + 1.22 + 0.21 + 1.20 = 5

⇒ 1100101b = 65hex

Convert ABChex to decimal and binary numeral systems.

* 1. To decimal numeral system

ABChex = A.162 +B.16 + C = 10.162 + 11.16 + 12 = 2748

⇒ ABChex = 2748d

b. To binary numeral system

Ahex = 10 d = 1010 b

Bhex = 11 d = 1011 b

Chex = 12 d = 1100 b

⇒ ABChex = 101010111100b

## Least Common Multiple

Find LCM(1234, 3456).

Answer:

GCD(1234, 3456) = 2 (1234 = 21 . 6171 ; 3456 = 27 . 33 )

LCM(1234, 3456) = |1234 . 3456| / GCD(1234, 3456) = 2132352