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# Arab inventions & discoveries

Done by:  
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# Chemistry



**Classification of Chemical Substances**



**Chemical Synthesis**



**Mercuric Oxide**



**Mercuric Chloride**



**Alembic**



**Gun Powder**



**Soft Drinks**



**Sulfur-Mercury theory of metals**



**Crystallization**



**Filtration**



**Distillation**



**Retort**

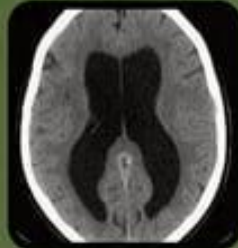




# Medicine & Biology



**Migraine Surgery**



**Treatment of Hydrocephalus**



**Optic Chiasm**



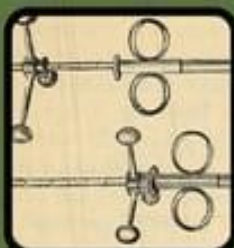
**Food Chains**



**Early Syringe**



**Metabolism**



**Lithotrite**



**Mental Institute**



**Treatment of Wart**



**Early Kocher's Method**



**Inheritance of Hemophilia**



**Anesthetic Sponge**





# Medicine & Biology



**Medical Instruments**



**Pharmacy**



**Apothecary**



**Pulmonary Circulation**



**Scabies Mites**



**General Hospital**



**Catgut Suture**



**Tracheotomy**



**Medical School**



**Ectopic Pregnancy**



**Vogt-Koyanagi-Harada syndrome**



**Waxed Cotton**



# Astronomy



**Zij**



**Length of the Solar year**



**Observatory**



**Astrolabe with Angular Scale**



**Sextant**



**Spherical Astrolabe**



**Armillary Sphere**



**Portable Celestial Globe**



**Telescope**



**Seamless Celestial Globe**



**Saphaea Arzachelis**



**Equatorium**





# Mechanics



**Weight-Driven  
Clock**



**Spinning  
Wheel**



**Mechanical  
Flywheel**



**Automatic  
Crank**



**Shale Oil  
Extraction**



**Fountain Pen**



**Steel Mill**



**Bridge Mill**



**Torpedo**



**Six-Cylinder  
Water Pump**



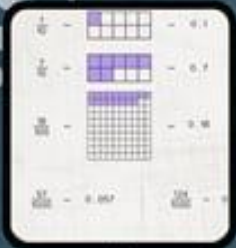
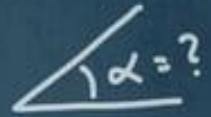
**Steam Jack**



**Steam  
Turbine**



# Mathematics & Physics



**Decimal Fractions**

n	p	1/n	
5-11	127	72	
5-17	193	438	
11-19	469	240	
5-41	407	252	
5-103	2129	1044	
29-69	2261	2700	
41-103	5-977	10753	7044
27	7-887	13313	7104
29	13-521	8480	7308
19	29-249	33405	17100
	5-53-97	37407	17752
31	149-449	124401	47500
	149-449	134401	47500
23	11-13523	313941	142200
19	89-1309	956403	477000

**Thabit Numbers**



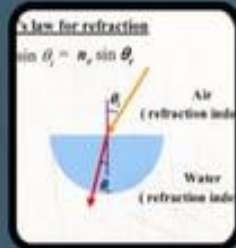
**Arabesque**



**Polar-Axis Sundial**

**Proof by Contradiction**  
 Theorem:  $\sqrt{2}$  is irrational.  
 Suppose  $\sqrt{2}$  was rational.  
 Then we have  $n, d$  integers without common factors such that  
 $\sqrt{2} = \frac{n}{d}$   
 We will show that  $n$  &  $d$  are both even

**Proof by Contradiction**



**Snell's Law**

$p(x) = q(x)(x-a) + p(a)$   
 $p'(a) = q(a)$

**Ruffini-Horner Algorithm**



**Law of Cotangents**

$(a+b)^2 = a^2 + 2ab + b^2$   
 $(a+b)^3 = a^3 + 3a^2b + 3ab^2 + b^3$   
 $(a+b)^4 = a^4 + 4a^3b + 6a^2b^2 + 4ab^3 + b^4$   
 $(a+b)^5 = a^5 + 5a^4b + 10a^3b^2 + 10a^2b^3 + 5ab^4 + b^5$   
 $(a+b)^6 = a^6 + 6a^5b + 15a^4b^2 + 20a^3b^3 + 15a^2b^4 + 6ab^5 + b^6$   
 $(a+b)^7 = a^7 + 7a^6b + 21a^5b^2 + 35a^4b^3 + 35a^3b^4 + 21a^2b^5 + 7ab^6 + b^7$   
 $(a+b)^8 = a^8 + 8a^7b + 28a^6b^2 + 56a^5b^3 + 70a^4b^4 + 56a^3b^5 + 28a^2b^6 + 8ab^7 + b^8$   
 $(a+b)^9 = a^9 + 9a^8b + 36a^7b^2 + 84a^6b^3 + 126a^5b^4 + 126a^4b^5 + 84a^3b^6 + 36a^2b^7 + 9ab^8 + b^9$

**Binomial Expansion**

$p$  be an integer  
 $p > 2$ .  $p$  is prime  
 $(p-1)! \equiv -1 \pmod{p}$   
 $p=2$  ( $p$  is prime)  
 $0! \equiv -1 \pmod{2}$   
 $1! \equiv -1 \pmod{2}$   
 $0 = -1$

**Wilson's Theorem**



**Law of sines**

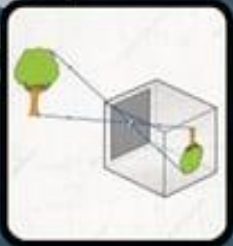
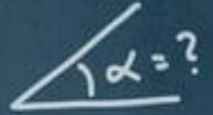


**Parallel Rulers**

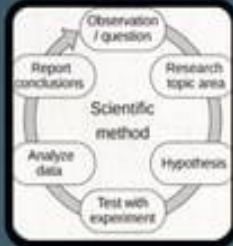




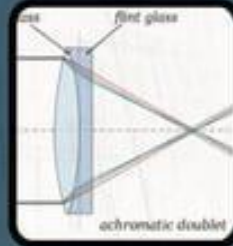
# Mathematics & Physics



**Pinhole Camera**



**Experimental Scientific Method**



**Convex Lens**



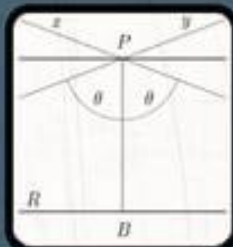
**Magnifying Glass**



**Alhazen's Problem**



**Arabic Numerals**



**Hyperbolic Geometry**



**Sine Quadrant**



**Muqarnas**



**Cauchy-Riemann Integral**



**Frequency Analysis**



**Cryptanalysis**



# Other...



**Paper Packaging**



**Minaret**



**Andalusian Oud**



**Chess Manual**



**Ghazal**



**Naker**



**Coffee**



**Lusterware**



**Music School**



**University**



**Kamal**



**Tin-glazing**



# Other...



**Three-Course  
Meal**



**Hard Soap**



**Damascus  
Steel**



**Papermaking  
Pulp**

# And many more...