**History of Mathematics (Math 4123)**
**Multiple Choice Questions**

**Problem 1. (Multiple Choice)**
Circle the letter corresponding to the best answer.

**Question 1.** The ancient Greeks used a

**(a)** simple grouping numeral system;

**(b)** multiplicative numeral system;

**(c)** ciphered numeral system;

**(d)** positional numeral system.

**Question 2.** The Fibonacci sequence contains

**(a)** $\ldots, 7, 11, 18, 29, 37, \ldots$

**(b)** $\ldots, 8, 12, 20, 32, 52, \ldots$

**(c)** $\ldots, 8, 13, 21, 34, 55, \ldots$

**(d)** $\ldots, 9, 14, 23, 37, 60, \ldots$

**Question 3.** The ancient Babylonians used a

**(a)** simple grouping numeral system;

**(b)** multiplicative numeral system;

**(c)** ciphered numeral system;

**(d)** positional numeral system.

**Question 4.** Which of the following is different from the rest?

**(a)** 1001011 (base 2);

**(b)** 2211 (base 3);

**(c)** 300 (base 5);

**(d)** 135 (base 7).

**Question 5.** All of the following are regular Babylonian numbers except

**(a)** 32;

**(b)** 35;

**(c)** 36;

**(d)** 45.

**Question 6.** Parchment is made from

(a) reeds;

(b) bamboo;

(c) hide;

(d) wood.

**Question 7.** Papyrus is made from

(a) reeds;

(b) bamboo;

(c) hide;

(d) wood.

**Question 8.** The Egyptians approximated the area of a circle to be that of a square on eight ninths of the diameter. To the nearest one hundreth, what value does this imply for $\pi$?

(a) 3.00;

(b) 3.14;

(c) 3.16;

(d) 3.56.

**Question 9.** The ancient Chinese estimated that a circular segment with base $b$ and height $s$ has area $s(b + s)/2$. To the nearest tenth, what value does this give for $\pi$?

(a) 3.00;

(b) 3.14;

(c) 3.16;

(d) 3.56.

**Question 10.** The flawed Pythagorean proofs which assumed commensurability were repaired by

(a) Thales' principle of inscription;

(b) Zeno's paradoxes;

(c) Eudoxus' theory of proportion;

(d) Archimedes' method of exhaustion.

**Question 11.** The first 4 Pythagorean pentagonal numbers are 1, 5, 12, and

(a) 16;

(b) 19;

(c) 22;

(d) 25.

**Question 12.** The angle between adjacent sides of a regular $n$-gon is $180°$ times

(a) $\frac{1}{3}$;

(b) $\frac{1}{n}$;

(c) $\frac{n-1}{2n}$;

(d) $\frac{n-2}{n}$.

**Question 13.** Hippocrates showed that

(a) all lunes are quadrable;

(b) some lunes are quadrable;

(c) all circles are quadrable;

(d) some circles are quadrable.

**Question 14.** Given two points in a plane, what is the minimum number of lines and circles which can be constructed from them to produce their midpoint?

(a) 0;

(b) 2;

(c) 4;

(d) 6.

**Question 15.** Apollonius wrote a book about

(a) prime numbers;

(b) plane geometry;

(c) solid geometry;

(d) conic sections.

**Question 16.** Diophantus used rational points on the unit circle to find

  (a) constructible points;

  (b) quadrable figures;

  (c) prime numbers;

  (d) pythagorean triples.


**Question 17.** Archimedes showed that the area of a regular $n$-gon with apothem $h$ and perimeter $Q$ is

  (a) $\frac{1}{n-1}hQ$;

  (b) $\frac{1}{2}hQ$;

  (c) $\frac{1}{3}h^2Q$;

  (d) $\frac{n}{n+2}hQ$.


**Question 18.** The Euclidean algorithm may be used to solve:
find an integer $x$ between 0 and 29 such that $7x \equiv 1 \pmod{30}$.

  (a) 2;

  (b) 13;

  (c) 17;

  (d) 29.


**Question 19.** The Chinese Remainder Theorem may be used to solve:
find an integer $x$ between 0 and 1457 such that $x \equiv 11 \pmod{47}$ and $y \equiv 17 \pmod{31}$.

  (a) 187;

  (b) 575;

  (c) 882;

  (d) 1117.


**Question 20.** The method of casting out nines succeeds because

  (a) $10 \equiv 1 \pmod 9$;

  (b) $9 \equiv -1 \pmod{10}$;

  (c) $3^4 \equiv 1 \pmod{10}$;

  (d) $100 - 99 = 1$.

**Question 21.** The ancient Greeks used a

(a) simple grouping numeral system;

(b) multiplicative numeral system;

(c) ciphered numeral system;

(d) positional numeral system.

**Question 22.** Which of the following is even?

(a) 121212 (base 3);

(b) 123123 (base 5);

(c) 123456 (base 7);

(d) 123321 (base 8).

**Question 23.** Which ancient culture used a rope with 12 knots to form right angles?

(a) Egyptian;

(b) Babylonian;

(c) Mayan;

(d) Incan.

**Question 24.** The angle between adjacent sides of a regular 9-gon is

(a) 108°;

(b) 124°;

(c) 140°;

(d) 156°.

**Question 25.** Hippocrates showed that

(a) all lunes are quadrable;

(b) some lunes are quadrable;

(c) all circles are quadrable;

(d) some circles are quadrable.

**Question 26.** Which of the following is *not* a term in the Fibonacci sequence?

(a) 55;

(b) 144;

(c) 299;

(d) 377.

**Question 27.** Cardano learned how to depress a cubic. How does one depress a quadratic?

(a) factoring;

(b) completing the square;

(c) quadratic formula;

(d) graphing.

**Question 28.** Viete realized that the coefficients of a polynomial are symmetric functions of the roots. Consider the polynomial $f(X) = (X + 1)(X + 2)(X + 3)(X + 4)(X + 5)(X + 6)(X + 7)$. What is the coefficient of $X^6$?

(a) 21;

(b) 28;

(c) 36;

(d) 5040.

**Question 29.** The invention of logarithms is credited to

(a) Werner;

(b) Napier;

(c) Briggs;

(d) Kepler.

**Question 30.** Who preferred the geocentric model?

(a) Copernicus;

(b) Brahe;

(c) Kepler;

(d) Galileo.

**Question 31.** Newton used his law of gravitation $F = G\frac{m_1 m_2}{r^2}$ to verify whose model of the solar system?

(a) Ptolemy;

(b) Copernicus;

(c) Kepler;

(d) Inquisition.


**Question 32.** DeMoivre's Formula is

(a) $\text{cis}^n(\theta) = \text{cis}(n\theta)$;

(b) $e^{i\pi} + 1 = 0$;

(c) $e^{i\theta} = \cos\theta + i\sin\theta$;

(d) $F - E + V = 2$.


**Question 33.** Which of the following regular $n$-gons is not constructible?

(a) $n = 5$;

(b) $n = 6$;

(c) $n = 7$;

(d) $n = 8$.


**Question 34.** Cardano wrote that complex numbers are:

(a) "obscured by the mists of imagination."

(b) "a pathway to actual solutions."

(c) "as subtle as they are useless."

(d) "the only logical next step."


**Question 35.** Fermat described Descartes' efforts in analytic geometry as:

(a) "unparalled as lines of like slop."

(b) "blindingly illuminating."

(c) "groping in shadows."

(d) "climbing ropeless."

**Question 36.** *If from any magnitude there be subtracted a part not less than its half, from the remainder another part not less than itshalf, and so on, there will at length remain a magnitude less than any preassigned magnitude of the same kind.* Who originally developed this idea?

(a) Pythagoras;

(b) Eudoxus;

(c) Euclid;

(d) Archimedes.


**Question 37.** *The area of a circle is equal to a right-angled triangle in which one of the sides about the right angle is equal to the radius, and the other is equal to the circumference, of the circle.* Who wrote this?

(a) Pythagoras;

(b) Eudoxus;

(c) Euclid;

(d) Archimedes.


**Question 38.** *I swear to you by the Sacred Gospel, and on my faith as a gentleman, not only never to publish your discoveries, if you tell them to me, but I also promise and pledge my faith as a true Christian to put them down in cipher so that after my death, no one shall be able to understand them.* Who wrote this?

(a) Fibonacci;

(b) del Ferro;

(c) Cardano;

(d) Galileo.


**Question 39.** *To divide a given square number into two squares, to divide a cube into two cubes, a fourth power, or in general any power whatever into two powers of the same denomination above the second is impossible.* Who wrote this?

(a) Diophantus;

(b) Descartes;

(c) Fermat;

(d) Euler.


**Question 40.** *If I have seen farther than others, it is because I stood on the shoulders of giants.* Who acknowledged this?

(a) Archimedes;

(b) Cardano;

(c) Newton;

(d) Euler.

**Question 41.** The ancient Greeks used a

  **(a)** simple grouping numeral system;

  **(b)** multiplicative numeral system;

  **(c)** ciphered numeral system;

  **(d)** positional numeral system.

**Question 42.** The ancient Babylonians used a

  **(a)** simple grouping numeral system;

  **(b)** multiplicative numeral system;

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**Question 43.** Which of the following is different from the rest?

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**Question 46.** Papyrus is made from

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**Question 47.** The Egyptians approximated the area of a circle to be that of a square on eight ninths of the diameter. To the nearest tenth, what value does this imply for $\pi$?

 (a) 3.0;

 (b) 3.1;

 (c) 3.3;

 (d) 3.6.

**Question 48.** The ancient Chinese estimated that a circular segment with base $b$ and height $s$ has area $s(b+s)/2$. To the nearest tenth, what value does this give for $\pi$?

 (a) 3.0;

 (b) 3.2;

 (c) 3.4;

 (d) 3.6.

**Question 49.** The flawed Pythagorean proofs which assumed commensurability were repaired by

 (a) Thales' principle of inscription;

 (b) Zeno's paradoxes;

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  **(a)** all lunes are quadrable;

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**Question 53.** Given two points in a plane, what is the minimum number of lines and circles which can be constructed from them to produce their midpoint?

  **(a)** 0;

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(a) $10 \equiv 1 \pmod 9$;

(b) $9 \equiv -1 \pmod{10}$;

(c) $3^4 \equiv 1 \pmod{10}$;

(d) $100 - 99 = 1$.

**Question 60.** Depressing a cubic equation is

(c) splitting a cube into 8 pieces;

(c) dividing by the leading coefficient;

(a) shifting the inflection point on the $y$-axis;

(b) placing the negative terms on the other side.