

Section A. Each correct answer is worth 1 point.

1. Solve for x : $3x + 9 = 2010$
 2. When a 6-faced die (number cube) is rolled, what is the probability of rolling an even number?
 3. The perimeter of isosceles $\triangle MAT$ is 32 units. If one of the congruent legs is 12 units, how long is the base?
 4. Three consecutive odd integers are added. If the smallest of these three integers is $2k - 1$, then how can the sum be represented in terms of k ?
 5. What is the slope of the line $x + 2y = 5 - 2x$?
 6. What is the name of the point $(0, 0)$ where the x -axis and the y -axis intersect?
 7. Let $n = -3$. Evaluate: $-5^2 + 5n + n^2$
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Section B. Each correct answer is worth 2 points.

8. Find the area of a trapezoid with vertices $A(3, 2)$, $B(7, 6)$, $C(10, 6)$, and $D(10, 2)$.
 9. Simplify and write your answer using only positive exponents: $\frac{2a^{-1}b^2}{3^{-1}a^2bc^0}$
 10. Evaluate: $\frac{6! - 5!}{4! + 3!}$
 11. Simplify: $5[7 - 2^2(6 - 2 \cdot 4) + 5] - 5 \cdot 1^3 + 2010^0$
 12. In pentagon $ARITH$, $m\angle A = 125^\circ$ and $m\angle R = 135^\circ$. The measures of the three remaining angles are in the ratio of 1 to 2 to 4. Find the measure of the largest angle of that pentagon.
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Section C. Each correct answer is worth 3 points.

13. Factor completely: $4x^4 + 16x^2y^2 + 25y^4$
14. Simplify completely so that no radical remains in the denominator: $\frac{\sqrt{3} - \sqrt{2}}{\sqrt{27} - \sqrt{3}}$
15. The sum of the digits of a three-digit number is 12. How many such three-digit numbers are there? (Note: a three-digit number does not begin with 0.)

Section A. Each correct answer is worth 1 point.

1. Find $3\sqrt{2010}$ to the nearest hundredth.
2. At what point (x, y) does the line $y = 3x + 6$ cross the x -axis?
3. Write an algebraic expression for this verbal expression: the sum of 4 times k and the square of m .
4. 5 is what percent of 8?
5. Find the distance between the two points $(3, 12)$ and $(-1, 4)$
(a) in exact, simplified form, and (b) rounded to the nearest hundredth.
6. The area of a square is 2010 square units. Find the length of its diagonal to the nearest whole number.
7. List all the prime numbers between 90 and 100, inclusive.

Section B. Each problem is worth 2 points.

8. How much water must be added to 10 gallons of lemonade to reduce its lemon content from 35% to 20%?
9. $f(x) = x^2 - 3x + 2010$. Find and express your answer in simplest form:
(a) $f(0)$ (b) $f(-2)$ (c) $f(m)$
10. Find the sum of all the factors of 2010.
11. The area of a circle is 2010 square units. Find the length of its diameter to the nearest whole number.
12. The polynomial equation $P(x) = x^5 + 2x^4 + 5x^3 + 34x^2 + 30x = 0$ has five roots. One of them is $1 + 3i$. Find the other four roots.

Section C. Each problem is worth 3 points.

13. Maternity nurse Obie LaMaz has treated 2010 patients, who were mothers and their newborns. If the only multiple births were 12 sets of twins and 4 sets of triplets, how many mothers were there?
14. A lattice point (a, b) in the coordinate plane is a point in which both a and b are integers. How many lattice points lie in the interior of the circle $x^2 + 6x + y^2 - 4y = 3$?
15. A flagpole is situated at the edge of a roof on the top of a building. From an observation point 2010 feet from the base of that building, the angles of elevation of the top and bottom of that flagpole are 14° and 12° , respectively. To the nearest foot, find the length (height) of the flagpole.