



Knights of Pi Math Tournament – Dec. 12, 2015
Individual Test 5th/6th

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| 1 | What is 10201 divided by 101? |
| 2 | What is $201+119$? |
| 3 | What is the smallest square number bigger than 350? |
| 4 | What is the x-intercept of: $y = 4x + 8$? |
| 5 | It takes 20 hours for Jay to paint a room, and 40 hours for Jason to paint the same room. How many minutes longer does it take Jason to paint a room than jay? |
| 6 | Evaluate $1724 + 5648 - 6589$. |
| 7 | How many ways are there to pick a Homecoming king and queen from a class of 150 boys and 50 girls? |
| 8 | How many two digit numbers are divisible by 6? |
| 9 | What is the smallest number that is both a perfect square and a perfect cube? |
| 10 | Sean the Sheep is driving along a road. He first drives for 40 miles at 20 miles per hour. Then he goes for another 40 miles at 10 miles per hour. What is Sean's average speed throughout the entire trip? |
| 11 | Johnny the Janitor is a low income worker. He earns \$7.25 an hour, and he works 40 hours each week. Every week Johnny spends an average of 300 dollars on housing, 150 dollars on food, 100 dollars on insurance, and 50 dollars on tuition. If he wants to break even, how much more an hour must he make? |
| 12 | How many three digit numbers are divisible by 12 but not divisible by 4? |
| 13 | The difference between two consecutive perfect squares is 11. What is their sum? |
| 14 | Evaluate $((52-29)^2 - (6-3)^2)/20$ |
| 15 | What is the sum of the 6 squared and 7 squared? |
| 16 | Chris is trying to finish his summer reading book Jane Eyre. If he originally planned to read 20 pages a day throughout the summer, but forgot to start until summer was exactly $\frac{2}{3}$ the way through, how many pages a day must he average to finish before school starts? |

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| 17 | Ken the Chemist has two solutions: solution A, which is 20% acid and solution B, which is 40% acid. When Ken pours different volumes of solution A and solution B together, he obtains a mixture that is 35% acid. If there are 2 gallons of solution A, how many gallons of solution B are there in the mixture? |
| 18 | The sum of 5 consecutive integers is 2520. What is the average of the 5? |
| 19 | What is the longest distance between two vertices of a regular hexagon of length 6? |
| 20 | How many points are there on the line $y = \frac{5x}{4}$ have both coordinates as integers where x is an integer between 1 and 100 inclusive? |
| 21 | The diameters of the three circles shown in this diagram lie on the same line. If the two smaller circles are equally sized, and the area of the larger circle is 16 cm^2 , what is the area of the shaded region? |
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| 22 | If I draw out all the diagonals in a regular pentagon. How many points of intersection are there? |
| 23 | What is the largest 3 digit number that is either a square number or a cube number? |
| 24 | How many problems in this test have a prime number index? |
| 25 | Three primes add to 22. What is the smallest of these three? |
| 26 | A cone shaped cup that opens upwards has radius 4 feet and height 10 feet. Water is poured into the cup until it is $\frac{1}{8}$ full. What is the height of the portion of the cup that is empty? |
| 27 | What is the length of the longest string of consecutive odd positive integers that are all primes? |
| 28 | What is the units digit of 2^{2015} ? |
| 29 | Triangle ABC has angle measures $\angle ABC = 50$, and $\angle CAB = 40$. If point D lies on side AC such that BD is an angle bisector, what is the angle measure of $\angle ADB$ in degrees? |

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| 30 | How many triangles can be drawn from the vertices of a regular hexagon? |
| 31 | A shape on the Cartesian Plane is bounded above the lines $y = 2x+3$ and $x+y = 6$ and below by the X and Y coordinates. What is this shape's perimeter? |
| 32 | If January 1st on a non-leap year is a Thursday, how many Thursdays are there in that year? |
| 33 | Two sides of a triangle have lengths 7 and 11. What is the largest possible area of that triangle? |
| 34 | Real numbers x and y exist such that $x + y = 2$ and $\frac{1}{x} + \frac{1}{y} = 2$. What is xy ? |
| 35 | A meteor crashes into the face of earth, creating a spherical crater that is 32 feet wide and 8 feet deep. What is the radius of the crater, in feet? |
| 36 | A regular hexagon has an area of 64cm^2 . A second hexagon is drawn with vertices at the midpoints of the sides of the original. What is the area of the second hexagon? |
| 37 | How many ways are there to rearrange the letters phrase "DOG TOY" such that there are still two words with 3 letters each? |
| 38 | Let AB be the diameter of a circle of radius 5, and C be another point on or within the circle. What is the maximum area of triangle ABC? |
| 39 | Kermit the Frog lies on the circle on the coordinate plane described by $x^2 + y^2 = 65$. After completing one full rotation around the circle, how many distinct lattice points does Kermit go over? |
| 40 | A family has three children, none of whom are the same age. What is the probability that the eldest is a daughter and the youngest is a son? |