

WSMC First Round Regional Knowdown 2010

"I will read the question twice then you will have 10 seconds to answer and your last answer given in the ten seconds will be the accepted one. If the answer is incorrect you will be asked to turn in your nametag and leave the competition. Any questions? Let's begin."

1.	In a bag containing 5 marbles, where 2 are black and 1 is red, what is the probability of randomly drawing a non-black?	$3/5$ or $.6$
2.	Solve for x in $7+2x=9$	1
3.	A right triangle has a leg of 2 and a hypotenuse $\sqrt{8}$. What is the length of the other leg?	2
4.	Evaluate $2x^2y$ when $x=5$ and $y = 1/2$.	25
5.	Evaluate and simplify 10 divided by $5/6$.	12
6.	Find the slope between the points $(-2, 2)$ and $(4, -1)$.	$-3/6$ or $-1/2$
7.	What is the probability of rolling two regular fair six sided dice and getting doubles?	$6/36$ or $1/6$
8.	Give the decimal form of 7 plus $-3/4$ plus $1/2$.	6.75
9.	Give the prime factorization of 30?	$2*3*5$
10.	What is the x intercept for the graph of $y=2x+1$?	$-1/2$
11.	Find 13% of 50.	6.5
12.	How many square yards are equivalent to 54 square feet?	6
13.	How much larger is the greater of $7/10$ and $2/3$?	$1/30$
14.	Find the square root of 2.25	1.5 or $3/2$ or $1\frac{1}{2}$

15.	Evaluate $5x^3y$ when $x = 4$ and $y = 1/16$.	20
16.	What is the median of 3, 2, 3, 5, and 9?	3
17.	If a circle has an area of 36π , what is the area of a sector with a central angle of 60° ?	6π
18.	What is the surface area of a cube with a volume of one?	6
19.	Evaluate and simplify $(4/5)^2 + (3/5)^2$	1
20.	Evaluate 9^4 divided by 3^4	81
21.	If $F(x) = 3x$, find $F(F(2))$	18
22.	Find the slope of the line through (4,0) and (4,8)	Undefined or no slope
23.	Evaluate (24) divided (8/7)	21
24.	Solve for x in $x^2 - 3x = 0$	0 or 3
25.	Find the slope of the line with the equation $3y+5x=-2$.	-5/3
26.	Find 250% of 250	625
27.	If $F(x) = 1-2x $ find $F(7)$	13
28.	Evaluate $3/4 - 2/5$	$7/20$ or 0.35
29.	Solve for x in $5 + 3x > 7$	$x > 2/3$
30.	Find the y intercept for the line whose equation is $7x + 10y = 30$.	3 or (0, 3)
31.	Find the diagonal of a rectangle with sides of $\sqrt{6}$ and $\sqrt{3}$.	$\sqrt{9}$ or 3
32.	Find the arithmetic mean of 6,8,10,12,14	10

WSMC Second Round Regional Knowdown 2010

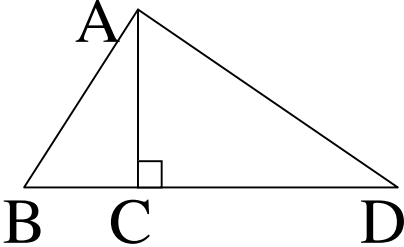
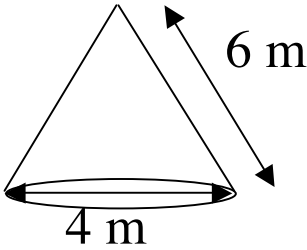
"The second round will consist of five questions. In this round I will read the question and all of you will write and circle your final answer on the paper in front of you. You will have 15 seconds to answer and I will count down the final three seconds; 3, 2, 1, 0. When I say zero your pencil must be on the desk in front of you or you will be disqualified. After the five questions are scored, if there is clearly a first, second, and third then Knowdown is over. If not, ties are broken in sudden death third round play. Are there any questions? Let's begin."

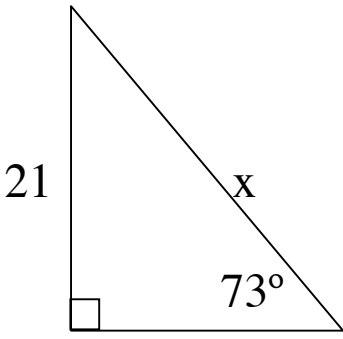
1	Of all the regular closed shapes with a perimeter of 8π , find the area of the shape with the maximum area.	16π
2	If it is 9 10 and 35 seconds what was the time 7 hours, 15 minutes and 40 seconds ago?	2:54:55
3	How many different ways are there to arrange 3 of 5 different vases on a shelf?	60
4	Express in simplest form the square of the complex number $7i-2$.	$-45-14i$
5	In scientific notation, what is the reciprocal of 5.0×10^2 ?	2×10^{-3}

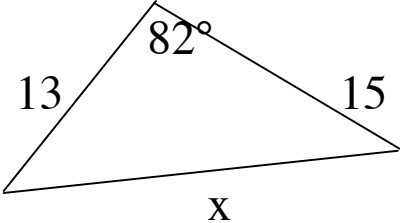
WSMC Third Round Regional Knowdown 2010

"I will place the question on the overhead and you will have 20 seconds to write your answer on your paper. I (we) will count down the last three seconds as in round two and then collect your papers. Again if your pencil is not down by the count of zero your answer will not be accepted. You will be able to use an SAT approved calculator on this section. Are there any questions? Let's begin."

Answers to round three:

<p>A sphere with a 5 cm radius is intersected by a plane 3 cm from its center. What is the exact area of the circle created by the intersection?</p>	<p>16π</p>
<p>Simplify:</p> $2 \ln(e^{2 \ln e})^{2 \ln e^2}$	<p>16</p>
<p>The measure of angle B is 60° and the measure of angle BAD is 75°. If BC is 2, how long is DB to the nearest hundredth?</p>	 <p>5.46</p>
<p>Peter the Great standardized the Russian length measurements to the English system. Three arshins were a sazhen and 500 sazhens were a verst. A verst was 3500 feet. How many inches was an arshin?</p>	<p>28</p>
<p>Find the exact surface area of the right cone shown.</p>	 <p>16π</p>
<p>$f(x) = x^2 + 2x$ and $g(x) = x + 1$. Solve $f(g(x)) = 0$</p>	<p>$x = -1$ or -3</p>

<p style="text-align: center;">Expand and simplify</p> $(x-2)(x-1)(x)(x+1)(x+2)$	$x^5 - 5x^3 + 4x$
<p>Find x to two decimal places:</p> 	<p style="text-align: right;">21.96</p>
<p>If $f(x)$ is a function over the real numbers, what is the range of $f(x)$ if $f(x) = x^2 - 8x$?</p>	<p style="text-align: right;">Reals greater than or equal to -16</p>
<p>Solve for x in: $x^2 - 5x > 0$.</p>	<p style="text-align: right;">$x < 0$ or $x > 5$</p>
<p>Find the equation of the line through $(-2, 1)$ and perpendicular to $y = 5x - 4$.</p>	<p style="text-align: right;">$y = -0.2x + 0.6$ or $y = -1/5 x + 3/5$ or other equivalent forms</p>
<p>Find the equation of the line of symmetry for the function: $f(x) = 2x - 3 - 4$</p>	<p style="text-align: right;">$x = 3/2$</p>

Describe the transformation where (x, y) is mapped to $(-x, y+2)$	Up 2 and reflected over the y axis
If $f(x) = x^2 + 2$ for $x > 0$, find the inverse of $f(x)$.	$f^{-1}(x) = (x-2)^{1/2}$
If a player pays 15¢ to roll a die and gets the number of pennies equal to the square of the number tossed, what is the expected value of the game for the player?	1/6 ¢
Find the length of x to two decimal places: 	18.43
Solve for all possible values of ϕ where $0^\circ \leq \phi \leq 360^\circ$: $\sin(\phi) = \sqrt{3/4}$.	60, 120
Find dy/dx if $y = (3x-1)^2$	$6(3x-1)$