Whatcom County Math Championship – 2012
Individual – 4th Grade

1) Calculate the following: 3 + 4 x 5 + 6

2) If nine more than 3 times a number is 60, what is the number?

3) If Pizza π has 4 toppings—pepperoni, mushrooms, pineapple or olives—and you want two toppings on your pizza, how many possible combinations can you have?

4) What is the average of the first ten odd numbers?

5) If a triangle has angles of 83° and 21°, what is the is the measure of the third angle?

6) Evaluate 3^4.

7) How many threes divide into 126?

8) Hot dogs cost $0.85 and popcorn cost $0.45. Russell has a $5.00 bill and buys 4 hot dogs and 3 popcorns; how much change will he get back (in cents)?

9) When it is 4:00, what is the angle measure in degrees between the minute hand and the hour hand?

10) The Fibonacci numbers start 1, 1, 2, 3, 5, 8… If Ringo counts backwards from 1000 by one Fibonacci number after another, what is the last positive number he will reach?

11) Write 0.72 as a reduced fraction.

12) Jeremy Lin is 6 feet 3 inches tall; how tall is he in inches?

13) What percent of 60 is 48?

14) If 4 widgets and 3 thingamajigs cost $29, but 5 widgets and 2 thingamajigs cost $24, how much does one thingamajig cost?

15) How many prime numbers are there less than 100?

16) Ivy is bobbing for apples, blindfolded. If there are 5 yellow apples, 6 red apples and 4 green apples in the barrel, what is the probability that she will catch a yellow or green apple, expressed as a reduced fraction?

17) Convert $5\frac{2}{3}$ into an improper fraction.

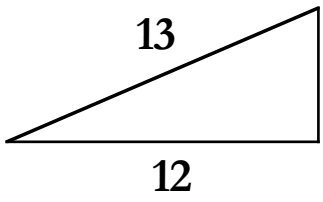
18) Ten people are in a room, and each shakes the hands of everyone else one time. How many total handshakes are made?

19) What is the reciprocal of $\frac{2}{3}+\frac{3}{4}$, as a reduced fraction?

20) If Ella rolls two six – sided dice and adds the results, what is the probability that she will roll a 5 (as a reduced fraction)?

21) How many multiples of 9 are there between 100 and 10000?

22) What is the perimeter of this right triangle:



23) Of all integer powers of 2 less than or equal to 1024, how many are also powers of 4?

24) A circle of radius 5 cm sits inside a circle of radius 10 cm. What fraction of the big circle's area lies outside the small circle (write as a reduced fraction)?

25) What is the smallest prime number bigger than 140?

26) A fair six – sided die is rolled; what is the probability that the number rolled will be a factor of 6 (write answer as a reduced fraction)?

27) What is the largest perimeter of a rectangle with whole – number sides and an area of 72 sq. cm.?

28) If you take the middle of each side of a rhombus and connect those points, what is the best name of the type of quadrilateral that is formed?

29) $3! = 3 \bullet 2 \bullet 1 = 6$. If we say $3\uparrow = 3! + 2! + 1!$, what is $5\uparrow$?

30) Jane bought a puzzle book at Vowell's bookstore. It was 20% off the original price, and there was a 5% sales tax added on. She paid with a $20 bill and got back $9.92 in change. What was the original cost of the book?

Whatcom County Math Championship – 2012
Individual – 5th Grade

1) Evaluate 3^4.

2) How many threes divide into 126?

3) Hot dogs cost $0.85 and popcorn cost $0.45. Russell has a $5.00 bill and buys 4 hot dogs and 3 popcorns; how much change will he get back (in cents)?

4) When it is 4:00, what is the angle measure in degrees between the minute hand and the hour hand?

5) The Fibonacci numbers start 1, 1, 2, 3, 5, 8… If Ringo counts backwards from 1000 by one Fibonacci number after another, what is the last positive number he will reach?

6) Write 0.72 as a reduced fraction.

7) Jeremy Lin is 6 feet 3 inches tall; how tall is he in inches?

8) What percent of 60 is 48?

9) If 4 widgets and 3 thingamajigs cost $29, but 5 widgets and 2 thingamajigs cost $24, how much does one thingamajig cost?

10) How many prime numbers are there less than 100?

11) Ivy is bobbing for apples, blindfolded. If there are 5 yellow apples, 6 red apples and 4 green apples in the barrel, what is the probability that she will catch a yellow or green apple, expressed as a reduced fraction?

12) Convert $5\frac{2}{3}$ into an improper fraction.

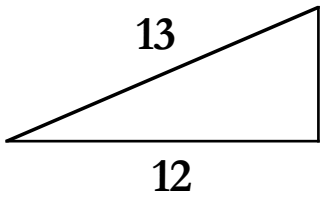
13) Ten people are in a room, and each shakes the hands of everyone else one time. How many total handshakes are made?

14) What is the reciprocal of $\frac{2}{3}+\frac{3}{4}$, as a reduced fraction?

15) If Ella rolls two six – sided dice and adds the results, what is the probability that she will roll a 5 (as a reduced fraction)?

16) How many multiples of 9 are there between 100 and 10000?

17) What is the perimeter of this right triangle:



18) Of all integer powers of 2 less than or equal to 1024, how many are also powers of 4?

19) A circle of radius 5 cm sits inside a circle of radius 10 cm. What fraction of the big circle's area lies outside the small circle (write as a reduced fraction)?

20) What is the smallest prime number bigger than 140?

21) A fair six – sided die is rolled; what is the probability that the number rolled will be a factor of 6 (write answer as a reduced fraction)?

22) What is the largest perimeter of a rectangle with whole – number sides and an area of 72 sq. cm.?

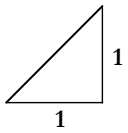
23) If you take the middle of each side of a rhombus and connect those points, what is the best name of the type of quadrilateral that is formed?

24) $3! = 3 \bullet 2 \bullet 1 = 6$. If we say $3\uparrow = 3! + 2! + 1!$, what is $5\uparrow$?

25) Jane bought a puzzle book at Vowell's bookstore. It was 20% off the original price, and there was a 5% sales tax added on. She paid with a $20 bill and got back $9.92 in change. What was the original cost of the book?

26) How many fifths are there in $12\frac{4}{5}$?

27) If Ivy builds a pattern with 12 triangles shaped like this, what will the total area be?



28) Jack is playing a game in which he starts with a number and flips a coin: if the result is heads, he multiplies his number by 2, if the result is tails, he divides his number by 2. Then he takes the answer he gets and flips the coin again, repeating for a total of 3 coin flips If Jack's starting number is 6, what is the probability that he ends his game with an odd number (express your answer as a reduced fraction)?

29) 0 and 1 are numbers that are both perfect squares and perfect cubes; what is the next largest number that is both?

30) Write the answer as a reduced fraction: $\frac{4}{2} \cdot \frac{6}{4} \cdot \frac{8}{6} \cdots \frac{2008}{2006} \cdot \frac{2010}{2008} \cdot \frac{2012}{2010} = ?$

Whatcom County Math Championship – 2012
Individual – 6th Grade

1) Write 0.72 as a reduced fraction.

2) Jeremy Lin is 6 feet 3 inches tall; how tall is he in inches?

3) What percent of 60 is 48?

4) If 4 widgets and 3 thingamajigs cost $29, but 5 widgets and 2 thingamajigs cost $24, how much does one thingamajig cost?

5) How many prime numbers are there less than 100?

6) Ivy is bobbing for apples, blindfolded. If there are 5 yellow apples, 6 red apples and 4 green apples in the barrel, what is the probability that she will catch a yellow or green apple, expressed as a reduced fraction?

7) Convert $5\frac{2}{3}$ into an improper fraction.

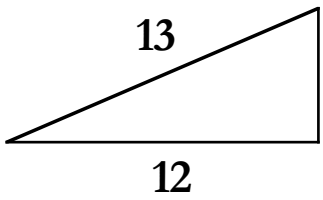
8) Ten people are in a room, and each shakes the hands of everyone else one time. How many total handshakes are made?

9) What is the reciprocal of $\frac{2}{3}+\frac{3}{4}$, as a reduced fraction?

10) If Ella rolls two six – sided dice and adds the results, what is the probability that she will roll a 5 (as a reduced fraction)?

1) How many multiples of 9 are there between 100 and 10000?

12) What is the perimeter of this right triangle:



13) Of all integer powers of 2 less than or equal to 1024, how many are also powers of 4?

14) A circle of radius 5 cm sits inside a circle of radius 10 cm. What fraction of the big circle's area lies outside the small circle (write as a reduced fraction)?

15) What is the smallest prime number bigger than 140?

16) A fair six – sided die is rolled; what is the probability that the number rolled will be a factor of 6 (write answer as a reduced fraction)?

17) What is the largest perimeter of a rectangle with whole – number sides and an area of 72 sq. cm.?

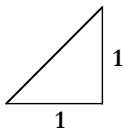
18) If you take the middle of each side of a rhombus and connect those points, what is the best name of the type of quadrilateral that is formed?

19) $3! = 3 \bullet 2 \bullet 1 = 6$. If we say $3\uparrow = 3! + 2! + 1!$, what is $5\uparrow$?

20) Jane bought a puzzle book at Vowell's bookstore. It was 20% off the original price, and there was a 5% sales tax added on. She paid with a $20 bill and got back $9.92 in change. What was the original cost of the book?

21) How many fifths are there in $12\frac{4}{5}$?

22) If Ivy builds a pattern with 12 triangles shaped like this, what will the total area be?



23) Jack is playing a game in which he starts with a number and flips a coin: if the result is heads, he multiplies his number by 2, if the result is tails, he divides his number by 2. Then he takes the answer he gets and flips the coin again, repeating for a total of 3 coin flips If Jack's starting number is 6, what is the probability that he ends his game with an odd number (express your answer as a reduced fraction)?

24) 0 and 1 are numbers that are both perfect squares and perfect cubes; what is the next largest number that is both?

25) Write the answer as a reduced fraction: $\frac{4}{2} \cdot \frac{6}{4} \cdot \frac{8}{6} \cdots \frac{2008}{2006} \cdot \frac{2010}{2008} \cdot \frac{2012}{2010} = ?$

26) At 12:00, the hour and minute hands of a clock are lined up exactly. To the nearest second, at what time will they first be 180° apart?

27) Point B and C lie on line $\overline{AD}$. The length of $\overline{AB}$ is 4 times the length of $\overline{BD}$, and the length of $\overline{AC}$ is 9 times the length of $\overline{CD}$. The length of $\overline{BC}$ is what fraction of the length of $\overline{AD}$, as a reduced fraction?

28) Take all the counting numbers less than 50 that have exactly 3 factors and add them together; what is the sum?

29) If an isosceles triangle has an angle of 108°, what is the measure of one of the other angles?

30) For whole numbers **m** and **n**, define $\mathbf{m} \nabla \mathbf{n} = (\mathbf{m} - \mathbf{n})^2$. What is $(\mathbf{a} - \mathbf{b})^2 \nabla (\mathbf{b} - \mathbf{a})^2$?

Whatcom County Math Championship – 2012
Individual – 7th + 8th Grade

1) Ivy is bobbing for apples, blindfolded. If there are 5 yellow apples, 6 red apples and 4 green apples in the barrel, what is the probability that she will catch a yellow or green apple, expressed as a reduced fraction?

2) Convert $5\frac{2}{3}$ into an improper fraction.

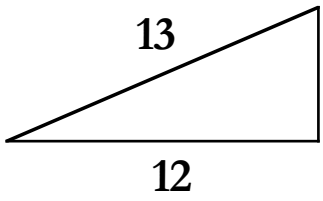
3) Ten people are in a room, and each shakes the hands of everyone else one time. How many total handshakes are made?

4) What is the reciprocal of $\frac{2}{3}+\frac{3}{4}$, as a reduced fraction?

5) If Ella rolls two six – sided dice and adds the results, what is the probability that she will roll a 5 (as a reduced fraction)?

6) How many multiples of 9 are there between 100 and 10000?

7) What is the perimeter of this right triangle:



8) Of all integer powers of 2 less than or equal to 1024, how many are also powers of 4?

9) A circle of radius 5 cm sits inside a circle of radius 10 cm. What fraction of the big circle's area lies outside the small circle (write as a reduced fraction)?

10) What is the smallest prime number bigger than 140?

11) A fair six – sided die is rolled; what is the probability that the number rolled will be a factor of 6 (write answer as a reduced fraction)?

12) What is the largest perimeter of a rectangle with whole – number sides and an area of 72 sq. cm.?

13) If you take the middle of each side of a rhombus and connect those points, what is the best name of the type of quadrilateral that is formed?

14) $3! = 3 \bullet 2 \bullet 1 = 6$. If we say $3\uparrow = 3! + 2! + 1!$, what is $5\uparrow$?

15) Jane bought a puzzle book at Vowell's bookstore. It was 20% off the original price, and there was a 5% sales tax added on. She paid with a $20 bill and got back $9.92 in change. What was the original cost of the book?

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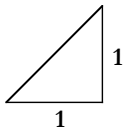

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19) 0 and 1 are numbers that are both perfect squares and perfect cubes; what is the next largest number that is both?

20) Write the answer as a reduced fraction: $\frac{4}{2}\cdot\frac{6}{4}\cdot\frac{8}{6}\cdots\frac{2008}{2006}\cdot\frac{2010}{2008}\cdot\frac{2012}{2010} = ?$

21) At 12:00, the hour and minute hands of a clock are lined up exactly. To the nearest second, at what time will they first be 180° apart?

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23) Take all the counting numbers less than 50 that have exactly 3 factors and add them together; what is the sum?

24) If an isosceles triangle has an angle of 108°, what is the measure of one of the other angles?

25) For whole numbers **m** and **n**, define $\mathbf{m} \nabla \mathbf{n} = (\mathbf{m} - \mathbf{n})^2$. What is $(\mathbf{a} - \mathbf{b})^2 \nabla (\mathbf{b} - \mathbf{a})^2$?

26) For a positive integer **n**, define **n**/ as the sum of all the positive divisors of **n** with the exception of **n** itself. For example, \6/ = 1 + 2 + 3 = 6, and \20/ = 1 + 2 + 4 + 5 + 10 = 22. What is \\12//?

27) If Tom can paint half a wall with $\frac{4}{5}$ of a can of paint, how much of a wall can he paint with a whole can of paint, as a reduced fraction?

28) What is the area of an isosceles triangle with sides 13, 13, and 24?

29) If $\left(\sqrt{16}\right)^3 = x^2$, what is x?

30) What is the average of the first 10 prime numbers, to the nearest tenth?