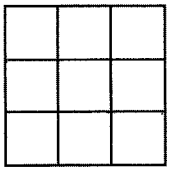
Warm-Up 13

1 ~~181.~~ _____ The figure shown consists of a large square divided into nine smaller, congruent squares. If a rectangle is chosen at random from this figure, what is the probability that it is a square? Express your answer as a common fraction.



2 ~~182.~~ _____ cm^2 An isosceles triangle has two congruent sides of length 13 cm and a height of 5 cm. What is the area of the triangle?

3 ~~183.~~ _____ If n is an even integer such that $0 < n < 10$, what is the sum of all possible unit fractions of the form $\frac{1}{n}$? Express your answer as a common fraction.

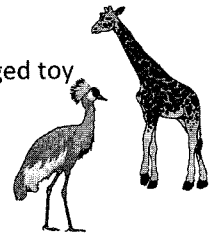
~~184.~~ _____ units The area of a particular rectangle is $2a^2 - ab - b^2$ units^2. If its width can be represented by the expression $a - b$, what is the length of the rectangle, in terms of a and b?

4 ~~185.~~ _____ mi/h If Mike travels for 3 hours at a rate of 20 mi/h and then travels for 2 hours at a rate of 30 mi/h, what is his average speed, in miles per hour?

5 ~~186.~~ _____ ints How many different, positive four-digit integers, with no repeated digits, can be formed using the digits 0 through 9?

6 ~~187.~~ _____ cm^3 A right circular cylinder has a surface area of 160π cm^2. If the height of the cylinder is twice the diameter of the base, what is the volume of the cylinder? ~~Express your answer in terms of π.~~

7 ~~188.~~ _____ toy animals Ben and Jerry each have a collection of toy animals. Ben collects only two-legged toy animals and Jerry collects only toy animals with four legs. Jerry has 10 more toy animals than Ben. There are 220 legs in their combined collections. How many toy animals does Jerry have?



8 ~~189.~~ _____ Five blue marbles and five green marbles are randomly arranged in a row. What is the probability that the marbles alternate in color? Express your answer as a common fraction.

9 ~~190.~~ _____ % If the volume of an enlarged cube is 8 times the volume of the original cube, by what percent has the length of each edge increased?

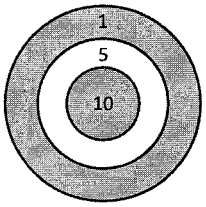
Warm-Up 14

10 ~~191.~~ _____ factors

How many factors of 2940 are perfect squares?

11 ~~192.~~ _____ scores

Michael will throw three darts that will hit the dartboard shown. His total score will be the sum of the scores for the three hits. How many different total scores could Michael earn?



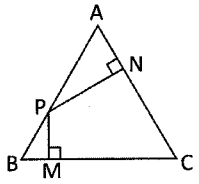
12 ~~193.~~ _____

For what value of x does $2^{18} = \left(\frac{1}{4}\right)^x$?

13 ~~194.~~ _____ m^3

A spherical balloon contains 5 cubic meters of air. If it is inflated so that its diameter doubles, what will be the volume of air in the balloon?

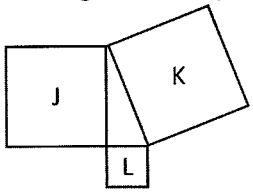
14 ~~195.~~ _____ cm



In the equilateral triangle ABC, shown here, $\overline{PM} \perp \overline{BC}$ and $\overline{PN} \perp \overline{AC}$. If AB = 12 cm, what is the value of CM + CN?

15 ~~196.~~ _____ cm^2

A right triangle is formed by the sides of three squares, as shown. The side length of the square labeled K is 7 cm, and the side length of the square labeled L is 2 cm. What is the area of the square labeled J?



16 ~~197.~~ _____

Kathy ate one-eighth of the jelly beans in a jar, and Sue ate one-fifth of the rest. Pat ate twice as many jelly beans as Kathy and Sue combined, and then Drew ate the rest. What is the ratio of the number of jelly beans Drew ate to the number of jelly beans Pat ate? Express your answer as a common fraction.

17 ~~198.~~ _____ intgrs

Randolph's favorite positive integers each have three digits and obey the following rules:

- All three digits are different.
- The sum of the digits is 9.

How many different favorite positive integers could Randolph have?

~~199.~~ (,)

What is the y-intercept of the line that contains the points (2, 0) and (4, –3)? Express your answer as an ordered pair.

18 ~~200.~~ _____

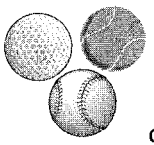
The median of an ordered set of 11 integers is 35. In this set, the median of the first five integers is 29, and the median of the last five integers is 39. If the minimum and maximum values of the set are 12 and 52, respectively, what is the greatest possible value of the mean of this set?

Warm-Up 15

19 ~~211.~~ _____ studs A total of 1500 middle school students were surveyed. The results showed that $\frac{1}{4}$ of the students have a pet living in their homes, $\frac{1}{5}$ have a grandparent living in their homes and $\frac{1}{3}$ have a baby living in their homes. What is the least possible number of students who have no pets, grandparents or babies living in their homes?

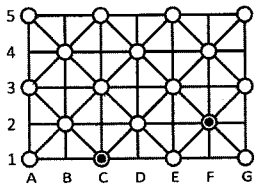
20 ~~212.~~ _____ The first term in a sequence is 5, and each subsequent term in the sequence is the units digit of 2 more than the square of the preceding term. What is the 100th term in the sequence?

21 ~~213.~~ _____ studs



Seventy-eight students participate in one or more of three sports: baseball, tennis and golf. Four students participate in all three sports. Five students play only baseball and golf. Two students play only tennis and golf. Three students play only baseball and tennis. If seven students play only tennis, and one student plays only golf, what is the total number of students who play only baseball?

~~214.~~ _____ The lines in the grid shown indicate "sight lines." A soldier standing at one location can see a soldier standing at another location only if the soldiers are on the same sight line. Two soldiers are located at C1 and F2, respectively. What are the locations of two other soldiers if none of the four soldiers are able to see any of the others?



22 ~~215.~~ _____ A right triangle has legs of length $\frac{3}{2}$ units and $\frac{20}{3}$ units. If the triangle has a perimeter of x units and an area of y units^2, what is the value of $x^2 - y^2$?

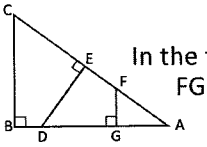
23 ~~216.~~ _____ What is the coefficient of $x^2y^2z^2$ in the expansion of $(x + y + z)^6$?

24 ~~217.~~ _____ A two-digit positive integer is randomly selected. What is the probability that the units digit is a multiple of the tens digit? Express your answer as a common fraction.

25 ~~218.~~ _____ coins In Quaternion, the coin with the least value is the qua. Four quas equal one quab, four quabs equal one quac, four quacs equal one quad, four quads equal one quae and four quaes equal one quaf. What is the least number of coins that have a combined value of 2012 quas?

26 ~~219.~~ _____ prs How many different pairs of numbers (m, n) can be formed using numbers from the list of integers {1, 2, 3, ... , 99, 100} such that $m < n$ and $m + n$ is even?

27 ~~220.~~ _____ units

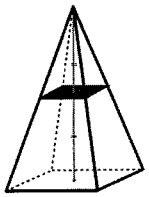


In the figure shown, right angles are as marked, AG = 4 units and FG = FE. If FG:DE:CB = 1:2:3, what is the length of $\overline{CE}$?

Warm-Up 16

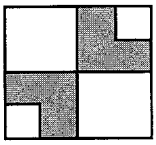
28 ~~221.~~ _____ ints How many positive two-digit integers each have the property that the integer's value increases by 75% when its digits are reversed?

29 ~~222.~~ _____ cm^3 The square pyramid shown has a volume of 64 cm^3. A plane parallel to the base of the pyramid bisects its altitude and divides the pyramid into two sections, as shown. What is the volume of the smaller pyramid?



30 ~~223.~~ _____ If $x + \frac{4}{x} = y + \frac{4}{y}$ and $x \neq y$, then what is the value of the product xy?

31 ~~224.~~ _____ %



A large square is divided into four congruent squares. Then those four squares are each divided into four smaller congruent squares, some of which are shaded, as shown. What is the probability that a dart thrown at random that lands in the largest square will also land in a shaded region? Express your answer as a percent to the nearest tenth.

32 ~~225.~~ _____ dance teams A 4-person dance team composed of 2 boys and 2 girls is to be selected from a group of 8 girls and 11 boys. How many different dance teams are possible?

33 ~~226.~~ _____ points Mrs. Garcia allowed each student in her class to drop the lowest of their five test scores. When Matt dropped the lowest of his test scores, a 60, his test average increased by 5 points. What is Matt's new test average?

34 ~~227.~~ _____ blocks What is the maximum number of 3" × 1" × 1" blocks that will fit into a box with interior dimensions of 5" × 5" × 10"?

35 ~~228.~~ _____ ° Using five identical index cards, the following structure can be created on a flat, level surface. What is the sum of the two marked angles on the side view of this construction?

36 ~~229.~~ _____ mi/h A cruise ship must average 22 mi/h for 10 hours to make its next port on schedule. During the first 4 hours, bad weather caused it to reduce its speed to 16 mi/h. What should its speed be for the remainder of the trip to make it to the next port on schedule?

37 ~~230.~~ _____

Ms. Robinson gives the following homework assignment: You must write an essay by tomorrow. You may work alone or in boy-girl pairs. As it turned out, $\frac{2}{3}$ of the boys and $\frac{3}{5}$ of the girls worked in pairs. What portion of the class worked alone? Express your answer as a common fraction.