

Meet 4 Practice Problems

1. What is the units digit of 9^4+9^7 ?
2. Three consecutive numbers are multiplied then this number is divided by four, leaving a non-zero remainder. What is the remainder?
3. Exactly one of the numbers below is a perfect square. Which one?
 - 1,048,578
 - 1,185,921
 - 2,137,443
 - 3,771,362
 - 8,156,737
4. What is the units digit of 2^{3^4} ?
5. What is the remainder when 2018^2 is divided by 13?

6. What is the greatest integer value of s for which $6s - 5 > 9s + 19$?
7. For how many integers n are both $2n - 7$ and $50 - 3n$ positive?
8. Jasmine has designed the perfect math puzzle which she wants to sell. Galois Games offers to manufacture her puzzles for \$3.50 each and charges a \$500 setup fee, while Noether Novelties will charge only \$2.30 per puzzle but requires a \$750 setup fee. What is the minimum number of puzzles for which Noether Novelties offers the lower total manufacturing cost?
9. What is the sum of all of the integer solutions to the compound inequality $-x \leq 3 < 10 - x$?
10. What is the x -intercept of the line through $(2, -1)$ and $(8, 3)$? Express your answer as a common fraction.

11. The cost (in dollars) of purchasing custom shirts is given by the equation

$$\text{Total Cost} = \$13.00 + \$7.50 \times (\text{Number of Shirts Purchased})$$

A math club decides to purchase custom shirts to wear at competitions. Each member contributes \$8.00 and they have the exact amount needed to buy everyone a shirt. How many members does the math club have?

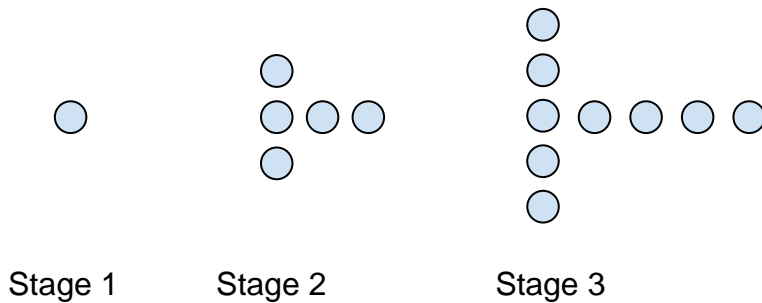
12. Determine the area of the triangle formed by the x - and y - axes and the line $3x + 8y = 20$. Express your answer as a common fraction.

13. The 7th term in an arithmetic sequence is 11 and its 14th term is 32. What is the 10th term in this sequence?

14. Following an outbreak of bird flu last year, the number of new cases each month has been $\frac{2}{3}$ as many as the previous month. If there were 48 new cases of bird flu this month, how many were there three months ago?

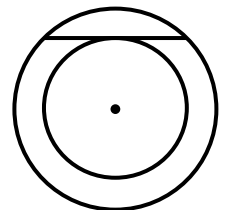
15. How many non-equilateral triangles with integer sides at most 7 units long have side lengths which form an arithmetic sequence? Triangles are considered the same if their three side lengths are the same (e.g. a triangle with side lengths 2, 3, and 4 is the same as one with side lengths 4, 3, and 2).

16. If the pattern continues, How many dots would be drawn in stage 11?

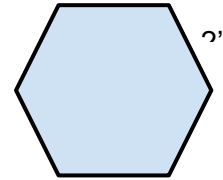


17. A right triangle has hypotenuse $\sqrt{65}$ inches and a leg of length 4 inches. What is the area of this triangle?

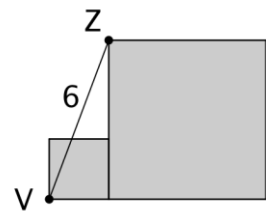
18. Chord AB lies on a circle of radius 10 cm and is tangent to a smaller circle of radius 6 cm as shown. Both circles share the same center, O. What is the length $|AB|$?



19. A kiddie pool is in the shape of a regular hexagon with sides 2 feet long. How many cubic feet of water is needed to fill the pool to a depth of 8 inches? Express your answer in simplest radical form.



20. The length of segment VZ is 6 units, as shown. Find the combined area, in square units, of the two shaded squares.

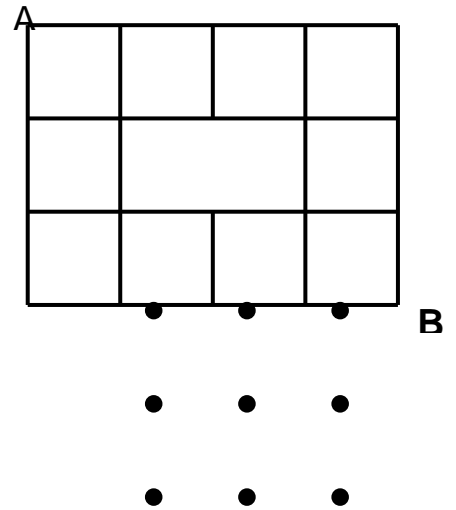


21. In how many ways can each of the numbers 1 through 6 be arranged in the blanks below so that numbers increase along each row and each number on the top row is less than the number below it?

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— — —

22. How many paths are there from A to B along the network shown moving only to the right or down (but never to the left or up)?



23. How many right triangles can be formed using three points from the regular 3x3 grid shown?

24. What is the arithmetic mean (i.e. average) of the numbers 7, 77, 777, 7777, 77777, 777777, and 7777777?

25. Aung scored an average of 12.5 points per game over the first 10 games of her team's basketball season. How many points must she average over the next five games to bring her season average up to 15 points per game?

26. A set of seven positive integers has a mean of 4, a median of 4, and a unique mode of 5. What is the range of these seven numbers?

27. The arithmetic mean of the numbers in the sequence below is 180:

$$x, x + 3, x + 6, x + 9, \dots, x + 300$$

What is the value of x ?