1. To find the total area of the window you add the area of the square, 36, to the area of the semicircle which is . So the total area is 36 + , D.

2. The volume of the sponge is 120 cubic inches, so it can only hold 60 cubic inches. After 2 mins it can hold 50 cubic in., after 4 mins it can hold cubic in., after 6 mins it can hold cubic in., and at 8 mins it holds cubic in, B.

3. The formula for the volume of a frustum is equal to π/3(R^2+r^2+Rr). Plugging in the numbers we get the answer 78π, B.

4. The surface area of a tetrahedron is given by the formula s^2sqrt3, and the volume is given by the formula s^3sqrt2/12, where s is the side length. Plugging in 4, we get 16sqrt3 and 16sqrt2/3. Adding these, we get (48sqrt3+16sqrt2)/3, B.

5. The cross section of the cylinder that is submerged is a third of the circle’s area minus the areas of two 30-60-90 triangles with hypotenuse 4. Solving for this, we get 16pi/3-4sqrt3. Multiplying this by the height to get the volume, we have (256π - 192sqrt3)/3, D.

6. The surface area is the inside area added to the outside area added to the two concentric circle end points, which is 100pi + 40 pi + 42pi = C)182pi

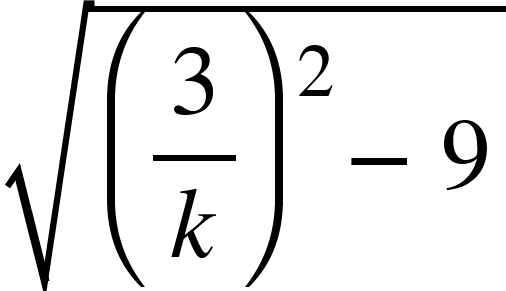
7. The ratio of the legs to the hypotenuse is 1 : 1 : . Therefore :

, C.

8. The maximum area triangle is an equilateral triangle with side length 4 inches. The altitude of this triangle is , so the area is (0.5)()(4) = , C.

9. The sin function cannot have a value of more than 1, so D.

10. As long as the shape is uniform in material then the Centroid is the center of mass. D

11. From the information given we know that sinC = 3/x. Since sinC = k, x = 3/k. Using the Pythagorean Theorem AC = , which is D.

12. To convert from radians to degrees, multiply by 180 then divide by pi. 540\*180/pi is none of the answers, so NOTA, E.

13. The 5th angle will always have the measure of the interior angle of a regular nonagon, which is 140, C. Note that this answer can also be reached with the concept of a limit, as well as solving for specific sequences.

14. After a few simplifications, it is obvious that the whole thing simplifies to 2^2, no matter how many arrows are between the initial two. Therefore the answer is 4, A.

15.The three numbers are a-d, a, a+d. Then the sum will be 3a = 21, a = 7. The product of the numbers will then be (7-d)\*7\*(7+d) = 315, which equals 49 - = 45 and d = 2.

This makes the three numbers: 5, 7, 9 and the greatest number 9, C.

16. This can be found by drawing out Pascal’s Triangle. Another way is through counting: there are 7 possible arrangements for each term (i.e. x^2y^4, y^3z^3, etc.), and there are 12 ways to order letters, for a total of 84 terms, C.

17. When reflected across the y-axis, coordinate B becomes (-2, 5). After the dilation of 1.5 the coordinate is (-3, 7.5) and when shifted to the right the resulting coordinate is (1, 7.5), A.

18. This is a permutation with repeating letters, 2Os and 2Bs. Therefore the answer is =90720, C.

19. The formula for the maximum amount of pieces from n cuts is (n^2+n+2)/2. Plugging in 6, we get 22, D.

20. 5 radians per second with a circumference of 4pi, he’s travelling at 10 feet per second. Converting to MPH, we get , A.

21. The value of the acute angle formed by the minute and hour hands of a clock is given by ½abs(60H-11M-11/60S), where H, M, and S are hours, minutes, and seconds, respectively. Plugging in the time given, we have 1327/24°, B.

22. With a few calculations, or plugging in numbers, it is easy to see that no matter how fast he runs the second lap, his average speed will never be able to reach 2x. E

23. 56B()()() = 24 seconds, but multiplied by 2 to come back, E.

24. To find one side of the right triangle whose hypotenuse is equal to the fold, we can solve the equation 4^2+x^2=(8-x)^2. Doing thing, we find that x=3. Subtracting two times this from 8 to find the side, we get 2. Using the Pythagorean Theorem on the triangle with sides 4 and 2, we get 2sqrt5, A.

25. Statement 1 is false because the converse of the conditional is “If Mr. Krabs sells 100 krabby patties, then today is Friday.” Statement 2 is false because the inverse is “If today is not Friday, then Mr. Krabs will not sell 100 krabby patties.” Statement 3 is the only one that is true, C.

26. ~p V ~q is equal to false or true, and since one of the statements is true then the compound statement is true. ~p V ~q is saying false or false, so the compound statement is false. p Λ q is false because both the statements are not true. ~p Λ q is false because in an and situation (Λ), both statements must be true for the compound statement to be true. So II, III, IV are the only false statements. C

27. The statement "It wasn't Barnacle Boy" has to be true and that "It was Patrick" is false. So,it wasn't Patrick who ate the cake. We have to consider that "It wasn't Sandy" in the second statement is false as we have taken "It wasn't Barnacle Boy" to be true. So, it was Patrick is true.Then in the third statement,"It was Barnacle Boy" has to be false because we considered "It wasn't Barnacle Boy" to be true.”It “It wasn't Spongebob" is true. In the fourth statement "It was Patrick" is false because from the first statement,we already have that it was not . So,"It was Sandy" is true.

In the fifth statement,we have that "It wasn't Spongebob" is true (as derived from the third statement).So,it was Mermaid Man has to be false. So,the only statement that holds to be true is that Sandy ate the cake, C.

28. With the perimeter equal to 60, this means that each side of the rhombus is 15. Since we know one of the diagonals, we can use Pythagorean theorem to find the other diagonal. + = and b = 12. The area of a rhombus is ½ \* horizontal diagonal \* vertical diagonal. So the area of the kite is ½ \* 18 \* 24 = 216, D.

29. The geometric mean is the square root of the product of the numbers. So it is the square root of 4096 which is 16, A.

30. Since angle A and B are supplementary angles they add up to 180. You get the equation 7x + 33 + 3x + 77 = 180, and x = 7. This makes the angle of A equal to 82, answer B.