1) (B): By Definition the three undefined terms are point, line, and plane.

2) (C): Recall that odds is defined as $\frac{desired}{not\, desired}$. The area of the equilateral triangle is $\frac{s^2\sqrt{3}}{4} = \frac{4^2\sqrt{3}}{4} = 4\sqrt{3}$. The area of the square = 64 units. The odds will be $\frac{4\sqrt{3}}{64-4\sqrt{3}} = \frac{16\sqrt{3}+3}{253}$

3) (B): Set up your proportion $\frac{12}{5} = \frac{x}{7}$. Solve and obtain $x = \frac{84}{5}$.

4) (A): $Diagonals = \frac{n(n-3)}{2}$ where n is number of sides, so $\frac{103(100)}{2} = 5150$

5) (B) In a circle with two intersecting chords, (BE)(ED) = (AE)(EC). (2)(x)=(3)(6). Therefore ED = 9. In a circle with perpendicular intersecting chords, $d^2 = (BE)^2 + (ED)^2 + (AE)^2 + (EC)^2$. In this case, $d^2 = 130$, therefore the area = $\frac{65}{2}\pi$.

6) (B) The three sides form a right triangle. $A = \frac{1}{2}bh$, in this case the area = 750

7) (B)

8) (A) Since the medians intersect perpendicular, they will form in the ratio of 2:1. Let D designate the point where the median from vertex A intersects BC and E be the point where the median from vertex B intersects AC. Let O be the point where the medians intersect perpendicular. Two equations can be formed. Let OD = x and OE = y. The two equations formed are, $x^2 + 4y^2 = 49/4$ *and* $4x^2 + y^2 = 9$. Solving you determine the length of the median to be $2\sqrt{6}$. Plugging back into your median formula $m = \frac{1}{2}\sqrt{2a^2 + 2b^2 - c^2}$, we arrive to find the length of the third side = $\sqrt{17}$

9) (A) Letting (x/2) be the length of the radius. We can find the area of the triangle using the formula A = $\frac{1}{2}ab(\sin c)$. Using this formula, we determine the area of the area of the triangle to be $\frac{x^2\sqrt{3}}{16}$. Subtracting this from the area of the circle and rearranging, we conclude that the area of the non enclosed area is $\left(\frac{x}{2}\right)^2\left(\pi - \frac{\sqrt{3}}{4}\right)$.

10) (B) Using $b^2 - 4ac$ we determine it to be a negative value. This will form an ellipse. Checking for degeneration indicates none is present so the answer is an ellipse.

11) (D) Using $\frac{1}{2}ab(\sin c)$ for the area we determine the area to be 25/4, so a + b = 29

12) (C) The number of lines of symmetry for a regular polygon is equal to the number of sides, therefore the number of lines is 8.

13) (A) Using Mass points, we can arrive that BP:PD = 25:12

14) (D) We first need to determine the area of the triangle by using the formula $a=\sqrt{s(s-a)(s-b)(s-c)}$, where s is the semi-perimeter and a, b, and c are the sides. The area is found to be $2\sqrt{66}$. Setting this equal to the equation $a=\frac{1}{2}bh$, where b is 10 in this case, we arrive at the altitude of $\frac{2\sqrt{66}}{5}$.

15) (E: -6) By definition, the geometric mean between two negative numbers is the negative of the square root of the product. In this case it would be $=-\sqrt{(-3)(-12)}$ which is = -6.

16) (A) Using the formula $x=\sqrt{y^2-(r_1+r_2)^2}$, where y is the distance between the centers and the r represent the radius of the circles. We determine x, the length of the common internal tangent, to be = 12.

17) (E: -1665/8) Completing the square of the equation, we arrive with the equation $(x-6)^2+(y+\frac{9}{2})^2=\frac{185}{4}$. The radius square = 185/4 and the ordinate = -9/2. Multiplying these two numbers we arrive at -1665/8.

18) (B) We need to first determine how far up the wall the ladder is. By using Pythagorean theorem we arrive at 24 feet. Next we must determine how far out the ladder is now if it slid 4 feet on the way (now 20 feet above ground). Using the Pythagorean theorem we arrive that the distance from the wall to the end of the ladder is 15 feet. This created a change of 8 feet.

19) (C) Given that for an inscribed circle, $r=\frac{2A}{P}$. We figure out that the area of the triangle = 120, and the perimeter = 60, therefore the radius = 4. This produces an area of 16π .

20) (A) By observation we can conclude that the area of each triangle will be one-fourth the area of the previous triangle. The area of the first triangle = $16\sqrt{3}$. Using the formula for infinite geometric sequence. $sum=\frac{first\,term}{1-r}$, the sum of all triangles = $\frac{16\sqrt{3}}{1-\frac{1}{4}}=\frac{64\sqrt{3}}{3}$.

21) (C) The ratio of the sides of the top nine parts to the entire triangle is 9/10. Therefore the ratio of the areas would be 81/100. Thus the ratio of the areas of the top nine parts to the largest bottom part is 81/19. Setting up the proportion 81/19 = x/38 and solving for x which would be 162. This would be the area of the top nine parts so add 38 to this and the area of the triangle would be 200.

22) (C) By the triangle inequality theorem, the sum of the two smallest sides of a triangle must be greater than that of the largest side. This only allows for 14 and 6 to be possible side lengths.

23) (C) In order to find the area of a polygon given the coordinates, the coordinates must be put into a

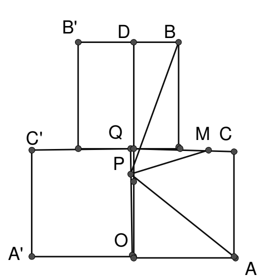
2 x 7 matrix in clockwise order repeating the first coordinate. The area is then found using the following formula: $\frac{1}{2}\left|(down)-(up)\right|$ where down is the sum of the product of the coordinates multiplying downward and up is the sum of the product of the coordinates going upward.

24) (C) Setting the radius of the circle = x, we can find the area of triangle AOB by using $\frac{1}{2}ab(\sin c)$. This gives us an area = $\frac{x^2\sqrt{3}}{4}$. The larger triangle CED is an isosceles right triangle with a side equal to $x\sqrt{2}$. This produces and area = x^2. Upon simplifying the ratio we arrive at $\frac{4\sqrt{3}}{3}$.

25) (D) Letting 2x be one side of the right triangle and 2y be the other side of the right triangle. We can form the following two formulas. $(x^2)+(2y)^2=\left(\sqrt{40}\right)^2$ and $(2x)^2+y^2=5^2$. Solving for x and y we determine the length of the two sides of the right triangle to be 4 and 6. The makes the hypotenuse be equal to $2\sqrt{13}$

26) (A) The slope of the given line is 32/3, which makes the slope perpendicular = -3/32. Since we are given the line goes through the point (0,7) this makes the y intercept of the new line = 7. The equation of the line is $y=-\frac{3}{32}x+7$. Substituting q and 2q into the equation we determine the value of q to be 3.3.

27) (D) Let O denote the center of the base of the figure, P the center of the desired circle, and r its radius. We assume that the circle passes through the points labeled A and B, and that the center P is on the axis of symmetry OD of the figure; this assumption is justified below. Thus r = PA = PB. In right triangle PDB, $PB^2=(2-OP)^2+(\frac{1}{2})^2$, and in right triangle POA, $PA^2=OP^2+1$. Equating these expressions for r^2, gives $4-40P+(OP)^2+\frac{1}{4}=(OP)^2+1$. This gives OP = 13/16. Substituting back into the equation evaluating for R gives $r=\frac{5\sqrt{17}}{16}$.



28) (A) The slope of the tangent line is the slope of the line perpendicular from the center (0,0) to (-12,-5). This gives the slope being equal to -12/5.

29) (E) The vector from B to A should be the same as from C to D. The vector from B to A is <-2, -6>. Combining this vector with the origin point C results in point D of (2,-3)

30) (A) Since CD trisects right angle C, angle BCD = 30, and angle DCA = 60. Drop a perpendicular DE to side AC so angle CDE = 30, so that triangle DEC is a 30-60-90 triangle. Let EC = x. That would mean DE = $x\sqrt{3}$ and DC = 2x. Using similar triangles $\frac{4-x}{x\sqrt{3}} = \frac{4}{3}$, this makes

$x = \frac{12}{3+4\sqrt{3}}$, $2x = \frac{24}{3+4\sqrt{3}} = \frac{32\sqrt{3}-24}{13}$.