1) B 11) B 21) A

2) A 12) C 22) B

3) A 13) D or E 23) A

4) B 14) C 24) A

5) D 15) C 25) D

6) E 16) A 26) C

7) C 17) D 27) C

8) B 18) A 28) A

9) C 19) A 29) C

10) A 20) B 30) B

1) B Kites do not have any parallel sides.

2) A Given distance between centers is the height of the trapezoid.

 rF + rL = $\frac{1}{π}$; heighttrapezoid = rF + rL = $\frac{1}{π}$; sum of bases = 2(rF + rL) = $\frac{2}{π}$; A = $\frac{\frac{1}{π} ∙ \frac{2}{π}}{2}$ = $\frac{1}{π^{2}}$

3) A SA of a cube = 1176 =6s2; s = 14; Perimeter of face which is a square = 4(14) = 56

4) B

5) D I. NO II. NO III. YES

6) E Using the Pythagorean Theorem and leg lengths of 16 and 12, the hypotenuse or side of the rhombus is 20.

7) C 29x + 41 = 360; x = 11 angle measures are 86°, 88°, 100°, and 86° $\frac{86}{2}$ = 43°

8) B OM is the hypotenuse of a triangle with leg lengths of x and 7x.

(7x)2 + x2 = 20; 50x2 = 400; x = $2\sqrt{2}$ rectangle's length = $14\sqrt{2}$ and width = $4\sqrt{2}$ P = $36\sqrt{2}$

9) C G 20° 45° M Draw line l parallel to GM and RA

 z°**y°** l y = 20, alternate interior angles

 z = 30, same side interior angles

 R 150°  A  x = y + z = 50

10) A Draw an altitude from point A to create a 30°-60°-90° triangle. A

 The length of the short leg of the triangle is 7 making the entire bottom

 base length 34. Median = $\frac{20+34}{2}$ = 27  14

  P 60°

 7

11) B A X D Draw altitudes AY and QX. This creates two special right

 45° triangles and a rectangle.

 12 QX = AY = $6\sqrt{2}$ ; AU = $12\sqrt{2}$

 30°

U Y Q

12) C 54 = $\frac{d\_{1}∙ d\_{2}}{2}$ = $\frac{x ∙3x}{2}$; x = 6 6 + 18 = 24

13) D Aoriginal = s2 and Afinal = 16s2 16:1

14) C No kites are trapezoids, and no trapezoids are kites.

15) C Arectangle = 16(15) = 240

 - AΔFOR = ½(5)(16) = 40

 - AΔFAN = ½(4)(15) = 30

 - AΔFGE = ½(4)(15) = 30

 Areaunshaded = 100

16) A Side of rhombus or base is 15 by Pythagorean Triple;

 Area = $\frac{18 ∙24}{2}$ = 216 = bh = 15h = 14.4

17) D XY is the midsegment of the trapezoid and double its length is the sum of the bases, 52.

 P A Leg length is 24; 2leg is 48. Perimeter = 52 + 48 = 100.

 12

 T 30° R

18) A Using special right triangles, x = 5 and y = $5\sqrt{3}$.

 60° Doubling x and y gives the lengths of each diagonal.

 10 x Product = 10$\left(10\sqrt{3}\right)$ = $100\sqrt{3}$

 y

19) A  A AE = 12 by Pythagorean Triple

 BE = $6\sqrt{3}$ by special right triangles

 20 B AB = 12 - $6\sqrt{3}$; factored is 6(2 - $\sqrt{3}$)

 60°

 D 16 E 6 C

20) B Opposite angles of a quadrilateral inscribed in a circle are supplementary.

 m∠A + m∠R = 38x + 28 = 180; x = 4

 m∠G = 180 - m∠T = 180 - 9(4) + 43 = 101°

21) A RO is a diagonal of the rhombus. It's midpoint is $\left(-\frac{1}{2}, 4\right)$. It's slope is $\frac{2}{3}$.

 The equation of the second diagonal is perpendicular and through the midpoint of the first diagonal. y - 4 = $-\frac{3}{2}\left(x+ \frac{1}{2}\right)$; in standard form the equation is 6x + 4y = 13.

22) B The slopes of SA and AM are equal; solve for x. M

 A

 $\frac{3}{4}= \frac{x-7}{7};x=\frac{49}{4} $  3 x-7

 S 4  A 7

23) A Shaded rectangle's height = x and base = 2x. Figure's height = 3x and base = 4x.

 Perimeter of figure = 56; 56 = 14x; x = 4.

 A shaded rectangle = 4(8) = 32

24) A By special right triangles, the leg lengths are

 60°  30 Legs of triangle are also height and base of rectangle.

 Arectangle = 15🞄$15\sqrt{3}$ = $225\sqrt{3}$

25) D x By special right triangles, the height of the parallelogram is $\left(\frac{x-4}{2}\right)\sqrt{3}$.

 Area = $30\sqrt{3}=x∙\left(\frac{x-4}{2}\right)\sqrt{3} $; x2 - 4x - 60 = 0; x = -6 and 10

 x - 4 h Sum = 10 + (10-4) = 16.

 60° 120°

26) C The side length of one of the squares is x. The perimeter is 14x and the area is 7x2.

 7x2 = 14x; x = 0 and 2. Side length is 2.

27) C The net of a cube only has 6 squares.

28) A Semi-perimeter is 14.

 A = $\sqrt{\left(14-10\right)\left(14-6\right)\left(14-4\right)(14-8)}= \sqrt{4∙8∙10∙6}= \sqrt{1920}=8\sqrt{30}$

29) C The solid formed by the rotation is two cones with the same base. Half the diagonal of the square is the height of the cone and the radius of the base, $4\sqrt{2}$.

 V = $2\left(\frac{π\left(4\sqrt{2}\right)^{2}\left(4\sqrt{2}\right)}{3}\right)= \frac{256π\sqrt{2}}{3}$

30) B Square: diagonal = $6\sqrt{2}$; side = 6; Area = 36

 Rectangle: base = x; height = 4x; Area = 36 = 4x2; x = 3; perimeter = 2(3 + 12) = 30