Theta Individual solutions:

1.D-

2.C-

3.D-

4.D- Draw yourself a picture!! Call angle Z=2y and angle U= 2x, that makes angles LST=2y and angles LTS= 2x. The angle bisectors create 2 angles equal to y and 2 angles equal to x. If you call LS=p then SZ=27-p. Call Lt=n then TU =24-n. Angle ZST =180-2y and angle UTS=180-2x. This creates 2 small isosceles triangle so SK =27-p and TK =24-n. Therefore the answer is p+n+27-p+24-n=51

5.B-The sum of the roots is –b/a so the sum is 5. Therefore 5-(5+3i)=-3i

6.D-Expand the first few terms of 

We will only need  



7.A-

Find the slope from the center to the tangent point and then take the negative reciprocal because they are perpendicular. This gives you ½. So we get x-2y=C. Plug in the point (3,2) to solve for C

8.C-

9.D-

10.C-Let B equal the cost of the bus and X equal the number of students. We will set up 2 equations 

11.C-factor the denominator as sum of cubes so the answer is C

12.C-

13.B- x+3y = C. Plug in the point (0,4) and you get answer B

14.D-Draw yourself a picture. Label the pieces x and 1-x and then use Pythagorean theorem to solve for x. 

Since we want the ratio of the areas: 

15.A-

16.B-They are the same line so it has at least one solution therefore consistent and because they are the same line they are dependent.

17.A-Since it is a parabola that opens up the minimum value occurs at the vertex. Use –b/2a to get x coordinate and then plug in to get the value of the function.



18.D-All negatives work!!

19.C-The sequence of terms starts out like this 2011, 2012, 2013, 2010, 2015, 2008,2017,…

What you see is that the even numbered terms keep dropping by 2 each time. If we look only at those terms you get 2012,2010, 2008,… Instead of looking for the 2014th term of all the terms create a sequence using the even number terms only and therefore you need to find the 2007th term of those. This creates an arithmetic sequence with a common difference of -2. So 2012+(1006)(-2)=0

20.C-Draw yourself a picture!! Call the side of the first square 1. Draw a segment from a vertex of the square to the center of the circle. This creates a radius of 1/2. So the area of the first circle is. Draw another picture with an inscribed square and the radius of the circle is half the diagonal of the square. Continue this and the last circle has a radius of  so the final answer is

21.B-

|  |  |  |
| --- | --- | --- |
| rate | time | distance |
| L | t | Lt |
| 4/5 L | 2t | 8/5 Lt |

13/5 Lt=13 Lt=5

22.A-You need to create perfect square for this to apply so: 

23.A-By drawing a picture you can see the parabola opens up so the generic form is: Since p is the distance from the directrix to the vertex, we get: 

24. D-Draw a picture!! Since Lu is perpendicular to MR it is bisected by MR, so each piece is 8 units long. If you draw a radius from center O to point L or U you create a right triangle with hypotenuse equal to the radius of 10. This means ZO is 6 so the answer is 6+10=16

25.D-treat the 2 people as 1 and you then have 6 factorial but you must multiply by 2 because the 2 can be in either order: 

26.B-For the sphere to be inscribed in the cylinder the height of the cylinder is twice the radius of the sphere and the cylinder, so we get 

27.C-



28.A-

29.C-Divide 3 into 2005 and ignore the remainder. Divide 4 into 2005 and ignore remainder. Add these answers and you get 1169. Then we must divide 12 into 2005 and ignore remainder. This gives 167 but since we don’t want both we must subtract it from 1169 twice!! Giving 835

30.B-Draw a picture!! Draw a segment from the center of the semicircle to the corner of the square. This creates radius and a right triangle. We get; 

Answers:

1. D
2. C
3. D
4. D
5. B
6. D
7. A
8. C
9. D
10. C
11. C
12. C
13. B
14. D
15. A
16. B
17. A
18. D
19. C
20. C
21. B
22. A
23. A
24. D
25. D
26. B
27. C
28. A
29. C
30. B