Questions on Grade 12 Entrance Exam :

12 年级入学考试测试卷　　姓名：_____

1. Let A and B be two given independent events such that P(A) =p and P(B) = q and P(exactly one of A, B) = 2/3, then value of 3p + 3q – 6pq is

A 跟 B 是两个独立事件，他们的概率如下所示，P（A 或者 B 二者选其一）=2/3，那么这个式子的值是多少

(a) 2
(b) -2
(c) 4
(d) -4

2. Three balls are drawn from a bag containing 2 red and 5 black balls, if the random variable X represents the number of red balls drawn, then X can take values

三个球从一个袋子中被抽出来，这个袋子包括 2 个红球跟 5 个黑球，如果随机变量 X 代表着选取的红球，那么 X 的值可以有哪些

(a) 0, 1, 2
(b) 0, 1, 2, 3
(c) 0
(d) 1, 2

3. Area bounded by the curve y = sin x and the x-axis between x = 0 and x = 2π is

由这一个正弦曲线还有 x 轴在值 0 跟 2 之间的区域围起来 的面积是多少

(a) 2 sq units
(b) 0 sq units
(c) 3 sq units
(d) 4 sq units

4. If $\int \sec^2(7 - 4x)dx = a \tan(7 - 4x) + C$, then value of a is

求 a 值

(a) 7
(b) -4
(c) 3
(d) −1/4

5.Area of the region bounded by the curve x = 2y + 3, the y-axis and between y = -1 and y = 1 is

被这个直线还有 y 轴在 y=-1 与 y=1 的区域之间围起来的部分面积是多少

(a) 4 sq units 3
(b) 3/2 sq units
(c) 6 sq units
(d) 8 sq units

6. A line makes angle α, β, γ with x-axis, y-axis and z-axis respectively then cos 2α + cos 2β + cos 2γ is equal to

一条线跟 x，y 和 z 轴形成了如上三个夹角，那么这样的一个等式的值等于多少

(a) 2
(b) 1
(c) -2
(d) -1

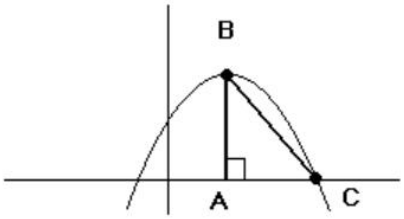
7. The distance of point (2, 5, 7) from the x-axis is

从 x 轴到这个点的距离是多少

(a) 2
(b) √74
(c) √29
(d) √53

8.一个直角三角形 ABC 跟一个双曲线内接，那么点 B 也是这个双曲线的顶点，点 C 是他与 x 轴的截距，如果双曲线公式已经告诉你了如下那么求出 C 的值，使得这个三角形 ABC 的面积是 32 个单位

The right triangle ABC shown below is inscribed inside a parabola. Point B is also the maximum point of the parabola (vertex) and point C is the x intercept of the parabola. If the equation of the parabola is given by $y = -x^2 + 4x + C$, find C so that the area of the triangle ABC is equal to 32 square units.



9. A parabola has two x intercepts at (-2 , 0) and (3 , 0) and passes through the point (5 , 10). Find the equation of this parabola.

一个双曲线在 x 轴上有两个交点（-2，0）还有（3，0），并且经过点（5，10），求这个双曲线的等式

10. 找到这个元的灯饰的一个经过（0，2）的切线

Find the equation of the tangent at (0 , 2) to the circle with equation

$$(x + 2)^2 + (y + 1)^2 = 13$$

Answer:

1. A
2. A
3. D
4. D
5. C
6. D
7. B
8.

   h = -b / 2a = 2 : x coordinate of the vertex of the parabola

   k = $-(2)^2 + 4(2) + C = 4 + C$: y coordinate of vertex

   x = $(2 + \sqrt{(4 + C)})$, x = $(2 - \sqrt{(4 + C)})$: the two x intercepts of the parabola.

   length of BA = k = 4 + C

   length of AC = $2 + \sqrt{(4 + C)} - 2 = \sqrt{(4 + C)}$

   area = (1/2)BA * AC = $(1/2)\ (4 + C) * \sqrt{(4 + C)}$

   $(1/2)\ (4 + C) * \sqrt{(4 + C)} = 32$: area is equal to 32

   C = 12 : solve above for C.

9.

   y = a(x + 2)(x - 3) : equation of the parabola in factored form

   10 = a(5 + 2)(5 - 2) : (5 , 10) is a point on the graph of the parabola and therefore satisfies the equation of the parabola.

   a = 5/7: solve the above equation for a.

   Divide $x^{(3} + 3x^2 -2Ax + 3)$ by $(x^2 + 1)$ to obtain a remainder = -x(1 + 2A)

   -x(1 + 2A) = 5x : remainder given

   -(1 + 2A) = 5 : polynomials are equal if they corresponding coefficient area equal.

10. A = -3