

Quant Monday answer key.

Part_a

- 1.C
- 2.E
- 3.E
- 4.C
- 5.B
- 6.D
- 7.E
- 8.A
- 9.C
- 10.D
- 11.D
- 12.D
- 13.A
- 14.B
- 15.C
- 16.C
- 17.A
- 18.E
- 19.D
- 20.E (13/14)
21. $6\sqrt{3}-3$
- 22.B
- 23.E
- 24.E
- 25.C
- 26.B

27. The probability of the dart landing outside the square can be expressed as follows:

To find the area of the circle, we need to first determine the radius. Since arc ADC has a length of π , we know that the circumference of the circle must be double this length or 2π . Using the formula for circumference, we can solve for the radius:

Therefore, the area of the circle is π .

To find the area of the square, we can use the fact that the diagonal of the square is equal to twice the radius of the circle. Thus, the diagonal of the square is 2π . Since the diagonal of the square represents the hypotenuse of a 45-45-90 triangle, we use the side ratios of this special triangle to determine that each side of the square measures π . Thus, the area of the square is π^2 .

Now we can calculate the total probability that the dart will land inside the circle but outside the square:

Interestingly, the probability does not depend on x at all, meaning that this probability holds true for any square inscribed in a circle (regardless of size).

- 28.D
- 29.A
- 30.E
- 31.B
- 32.
- 33.C
- 34.A
- 35.B
- 36.D

37.E

Part_b

- 1.B
- 2.E
- 3.C
- 4.E
- 5.C
- 6.D
- 7.A
- 8.C
- 9.D
- 10.C
- 11.B
- 12.D
- 13.E
- 14.B
- 15.A
- 16.D
- 17.D
- 18.C
- 19.E
- 20.480

Good arrangements = total possible arrangements – bad arrangements.

Total arrangements = number of ways to arrange 6 distinct elements = $6!$
 $= 6 \times 5 \times 4 \times 3 \times 2 \times 1 = 720$.

Bad arrangements are those in which J and M sit next to each other. To determine the number of bad arrangements, we need to count the number of ways to arrange the following 5 elements: JM (as a unit) and the other 4 people. The number of ways to arrange 5 distinct elements = $5! = 5 \times 4 \times 3 \times 2 \times 1 = 120$.

Since JM can be reversed to MJ, the result above needs to be doubled:
 $2 \times 120 = 240$.

Good arrangements = total possible arrangements – bad arrangements =
 $720 - 240 = 480$.

- 21.C
- 22.C
- 23.A
- 24.B
- 25. 1625
- 26.B
- 27.C
- 28.B
- 29.A

30.E
31. 35
32.A
33.C
34.E
35.A
36.E
37.C

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