TWO NEW FORMULAE FOR CIRCLE WITH NO Pi of 2500 Years
(2543rd Paper)

1. Established π value is 3.14159265358 or simply 3.14
2. For area = πr^2

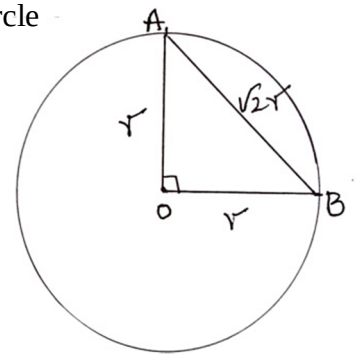
   For circumference = $2\pi r$
3. Proposed formula are based on radius and chord of circle
4. Circle

   Centre = 0

   Radius = OA = OB $= r = 1/2$

   Chord $= AB = \sqrt{2}\, r = \dfrac{\sqrt{2}}{2}$

   Half chord $\dfrac{\sqrt{2}}{4}$



5. New formula for circumference **is 7 times of radius – Half Chord**

   $7r - \dfrac{\sqrt{2}\ r}{2}$ where $r = \dfrac{1}{2}$

   $\left(7 \times \dfrac{1}{2}\right) - \left(\dfrac{\sqrt{2}}{2} \times \dfrac{1}{2}\right) = \dfrac{7}{2} - \dfrac{\sqrt{2}}{4} = \dfrac{14 - \sqrt{2}}{4} = 3.1464466094$
6. New formula for area of circle

   $\left(\dfrac{7r}{2} - \dfrac{\sqrt{2}\, r}{4}\right) \times r = \left(\dfrac{14 - \sqrt{2}}{4}\right) r^2$
7. Let us equate established formulae with the new formula for Circumference

   $2\pi r = 7r - \dfrac{\sqrt{2}\, r}{2}$

   $2\pi r = \left(\dfrac{14 - \sqrt{2}}{2}\right) r$

   $\pi = \dfrac{\left(\dfrac{14 - \sqrt{2}}{2}\right) r}{2r}$

   $\pi = \dfrac{14 - \sqrt{2}}{4}$

Area $= \pi r^2 = \left(\dfrac{7r}{2} - \dfrac{\sqrt{2}\, r}{4}\right) r$

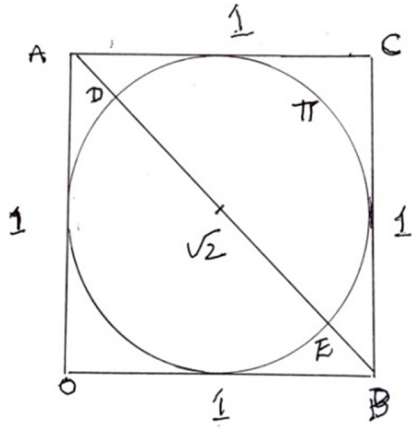
$$\pi r^2 = \left(\frac{14-\sqrt{2}}{4}\right) r^2$$

$$\pi = \frac{14-\sqrt{2}}{4}$$

Flash:

The AOB triangle in the circle invites the Pythagorean theorem.

Let OA and OB are made side of square and AB Chord of Circle now becomes diagonal of square.



8. Square AOBC

   AO = 1

   AB = Diagonal = $\sqrt{2}$

   (Pythagorean theorem)

9. Circle Diameter = DE = 1

   Circumference $= \pi d = \pi \times 1 = \pi$

10. **Statement**

Four times of circumference of inscribed circle $(4 \times \pi = 4\pi)$ when subtracted from fourteen times of side of square is equal to the diagonal length $(\sqrt{2})$ of square.

14 sides – 4 times of circumference = Diagonal of square

$$14d - 4\pi d = \sqrt{2}\, d$$

$$14d - \sqrt{2}\, d = 4\pi d$$

$$4\pi = 14 - \sqrt{2}$$

$$\pi = \frac{14-\sqrt{2}}{4}$$

11. The ancient two fundamental geometrical principles: π constant and Pythagorean theorem are very much related.

To conclude, as Pythagorean theorem is 100% correct, so also π value $\frac{1}{4}\left(14-\sqrt{2}\right)$ is correct.

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