26 August 2023 13:28

Numbers

$a^2+b^2+c^2+d^2=17$ a, b, c, d → whole nos (0, 1, 2, ...)

0 1 4 9 16

$\boxed{0+0+1+16}=17$

$\boxed{0+4+4+9}=17$.

a^2	b^2	c^2	d^2
0	0	1	16
	0	16	1
	1	0	16
	1	16	0
	16	0	1
	16	1	0

$1+8\times1=9$

S = 1 2 3 4 5 6 7 8 9 = 45

10 10 10 10

Avg = 5.

10 avg = 5

Sum of the series = avg of the series × n.

= middle no × n

= 5 × 9

AP series where the 50th term is 20. What is the sum of the first 99 terms.?

$S = n\left(\frac{t_1+t_n}{2}\right) = \frac{n}{2}\left[t_1+t_n\right] = \frac{n}{2}\left[2a+(n-1)d\right]$

49 terms t_{50} 49 terms. 99 terms

middle = avg

97 × 88 without performing multiplication.

−3 −12

8536.

106 × 118

+6 +18.

12408

12508

16×8 = 128

84 × 92

−16 −8

1

7628

7728

106×93

$+6 \quad -7$

$10300 - 42$

10258

$72 \times 74.$

$-28 \quad -26$

$46.$

$80 - 120$

$y = x^2 + kx + 4 > 0.$ find K.

$a > 0$

$D < 0$.

$K^2 - 4 \times 4 < 0$

$K^2 < 16,$

$-4 < K < 4$

$K^2 - 16 < 0$

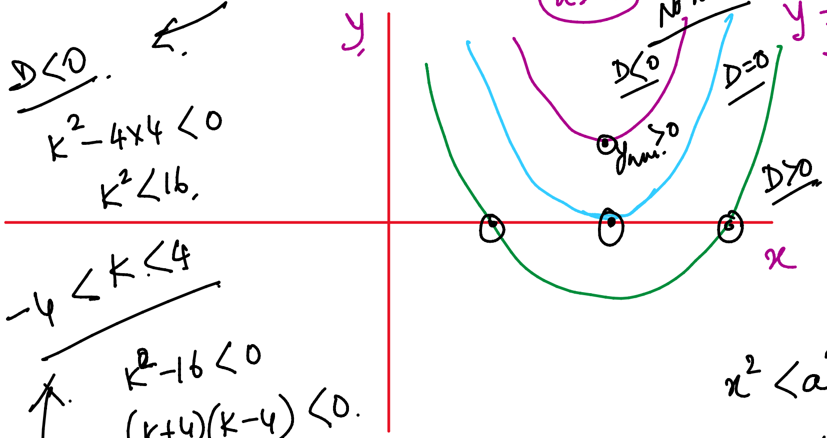
$(K+4)(K-4) < 0.$

$K > -4$

& $K < 4$.

~~$K < -4$~~

~~& $K > 4$~~



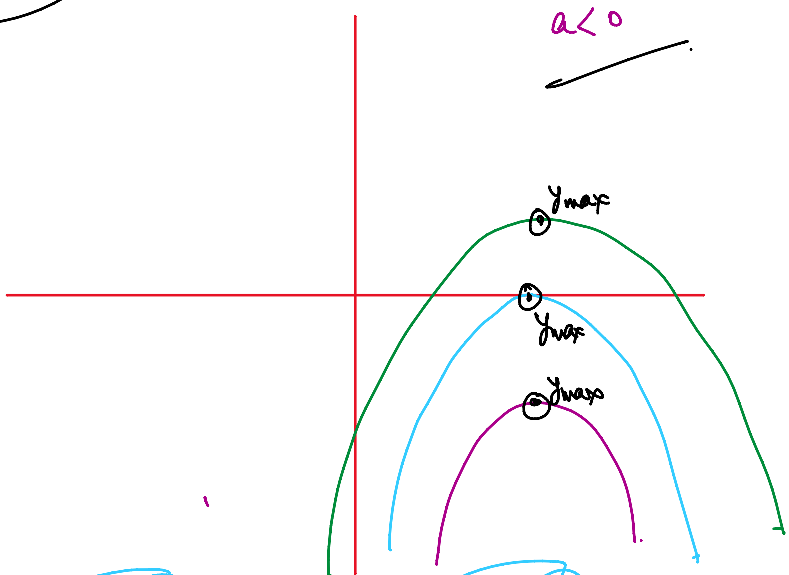
$y = ax^2 + bx + c$

$a > 0 \qquad a < 0$

$x^2 < a^2 \qquad x^2 > a^2$

$-a < x < a \qquad x > a$ or $x < -a$

$a < 0$



$(a-2)^2 + (b-2a)^2 + (2c-3b)^2 = 0.$ find $a + b + c$

$0 \quad 0 \quad 0$

$R^2 \geq 0 \longrightarrow$ definition of real no

O O $R^2 \geq 0$ O → definition of real no

If sum of squares of 2 or more nos = 0
then each square = 0

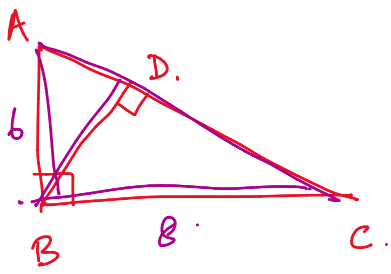
$a = 2$ $b = 4$ $c = 6$

Terminating decimals & recurring decimals

$\frac{1234567}{160} = 2^5 \times 5$ $\frac{1234}{30} = 2 \times 3 \times 5$

If the denominator consists of powers of 2 and 5 ONLY then it will be terminating.

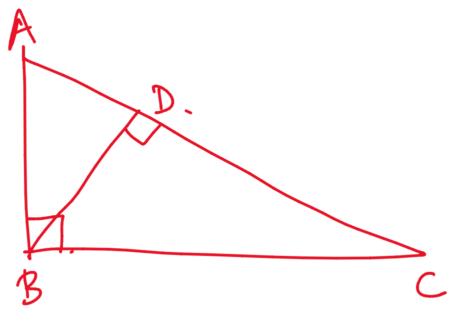
The no of digits after the decimal point (in a terminating decimal) = HIGHEST POWER of 2 or 5 in the denominator



$AB = 6$ $BC = 8$

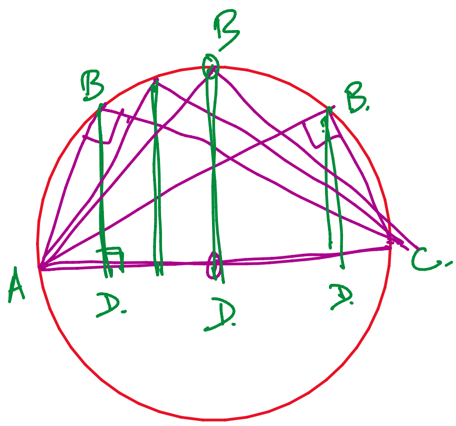
find BD

$\frac{1}{2} \times AB \times BC = \frac{1}{2} \times BD \times AC$



$AC = 12\,cm$

find the max length of BD



$(BD)_{max}$ = Radius

$= \frac{\text{hypotenuse}}{2}$

$\ldots > \sqrt{36}$

find the minimum value of $(a+b)$ if $ab = 36$.

$\frac{a+b}{2} \geq \sqrt{36}$

$a+b \geq 12$

$(AM)_{min} = (GM)_{max}$

$\frac{a+b}{2} = \sqrt{ab}$

$a+b-2\sqrt{ab} = 0$

$(\sqrt{a})^2+(\sqrt{b})^2-2\sqrt{a}\sqrt{b} = 0$

$(\sqrt{a}-\sqrt{b})^2 = 0$

$a = b$.

$R^2 \geq 0$

$(a-b)^2 \geq 0$

$a^2+b^2-2ab \geq 0$

$a^2+b^2 \geq 2ab$.

$\frac{a^2+b^2}{2} \geq ab$.

$\frac{a^2+b^2}{2} \geq \sqrt{a^2b^2}$

$AM(a^2,b^2)$ $GM(a^2,b^2)$

$\frac{a+b}{2} \geq \sqrt{ab}$.

$AM \geq (\ \ )$

$(AM)_{min} = (\ \ )$ ✓

$\frac{a+b}{2} \geq \sqrt{ab}$

$(\ \ ) \geq GM$

$(\ \ ) = (GM)_{max}$ ✓

School exam

Trigonometry.