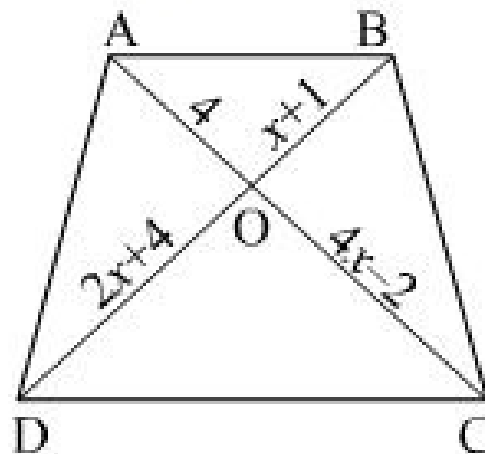Triangles Ex 4.4 Q1

Answer :

(i) It is given that $AB \parallel CD$.

We have to find the value of x.

Diagonals of the para

Now $\dfrac{DO}{OA} = \dfrac{CO}{OB}$

$\Rightarrow \dfrac{4x-2}{4} = \dfrac{2x+4}{x+1}$

$4(2x+4) = (4x-2)(x+1)$

$8x+16 = x(4x-2)+1(4x-2)$

$8x+16 = 4x^2 - 2x + 4x - 2$

$-4x^2 + 8x + 16 + 2 - 2x = 0$

$-4x^2 + 6x + 18 = 0$

$4x^2 - 6x - 18 = 0$

$$4x^2 - 12x + 6x - 18 = 0$$

So

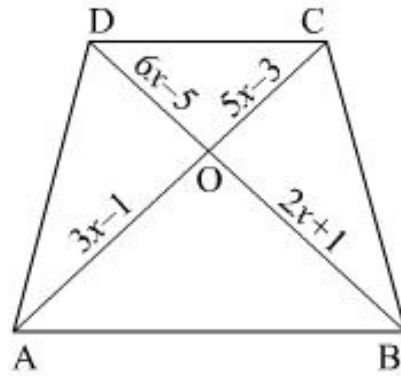$$4x(x-3) + 6(x-3) = 0$$

$$(4x+6)(x-3) = 0$$

Therefore $4x+6 = 0$ and $x-3 = 0$

Hence $\boxed{x = 3}$

(ii) It is given that $AB \parallel CD$

We have to find the value of x

Now $\dfrac{DO}{OA} = \dfrac{CO}{OB}$

$$\Rightarrow \dfrac{6x-5}{2x+1} = \dfrac{5x-3}{3x-1}$$

$$(6x-5)(3x-1) = (2x+1)(5x-3)$$

$$3x(6x-5) - 1(6x-5) = 2x(5x-3) + 1(5x-3)$$

$$18x^2 - 15x - 6x + 5 = 10x^2 - 6x + 5x - 3$$

$$18x^2 - 10x^2 - 21x + 5 + x + 3 = 0$$
$$8x^2 - 20x + 8 = 0$$
$$8x^2 - 16x - 4x + 8 = 0$$
$$8x(x-2) - 4(x-2) = 0$$
$$(8x-4)(x-2) = 0$$

So
$$(8x-4)(x-2) = 0$$

Therefore $8x - 4 = 0$ or $x - 2 = 0$

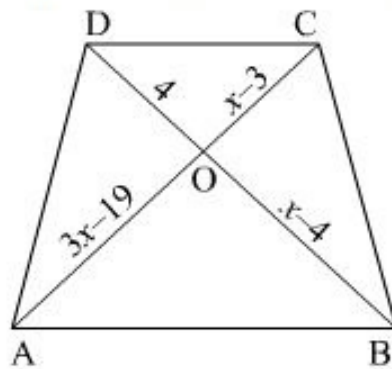Hence $x = \frac{1}{2}$ or $x = 2$.

For $x = \frac{1}{2}$, OD is negative.

Hence $\boxed{x = 2}$

(iii) It is given that $AB \parallel CD$.

And $OA = 3x - 19$, $OB = x - 4$ $OC = x - 3$ and $OD = 4$

We have to find the value of x

Now $\dfrac{AO}{OC} = \dfrac{BO}{OD}$

$\Rightarrow \dfrac{3x-19}{x-3} = \dfrac{x-4}{4}$

$4(3x-19) = (x-3)(x-4)$

$12x-76 = x(x-4)-3(x-4)$

$12x-76 = x^2 - 4x - 3x + 12$

$12x-76 = x^2 - 7x + 12$

$-x^2 + 7x - 12 + 12x - 76 = 0$

$-x^2 + 19x - 88 = 0$

$x^2 - 19x + 88 = 0$

So

$x^2 - 11x - 8x + 88 = 0$

$x(x-11) - 8(x-11) = 0$

Therefore $x-11 = 0$ and $x-8 = 0$

Hence $\boxed{x = 8}$ or $\boxed{x = 11}$.

********** END *********