

Using a convenient  $\Delta$ :

In  $\Delta SAC$  we have:

Since pts  $A$  &  $S$  have same abscissa  $x_A = x_S = 1$

then, st. line  $(AS)$  is parallel to  $y$ -axis

& pts  $A$  &  $C$  have same ordinates  $y_A = y_C = 3$

so, st. line  $(AC)$  is parallel to  $x$ -axis

but  $x$  &  $y$  axes are perpendicular (given that it is orthonormal)

hence  $(AC) \perp (AS)$  (two lines parallel to two perp. lines resp. are perp.)

Apply pyth. theorem

$$SC^2 = SA^2 + AC^2$$

$$= 1^2 + 2^2$$

$$= 5$$

Thus,  $SC = \sqrt{5}$  units of length

b) In quadrilateral  $SKDC$  we have:

apply converse of pyth. theorem in  $\Delta SKC$ :

$$KC^2 \stackrel{?}{=} SC^2 + SK^2$$

$$\sqrt{10}^2 \stackrel{?}{=} \sqrt{5}^2 + \sqrt{5}^2$$

$$10 \stackrel{?}{=} 5 + 5$$

$$10 = 10$$

hence  $\Delta SKC$  is right at hypotenuse  $[KC]$ .

$C$  &  $D$  have same abscissa,  $x_C = x_D = 3$

so,  $(CD) \parallel y$ -axis

$K$  &  $D$  have zero ordinates,  $y_K = y_D = 0$

so,  $K$  &  $D$  are on  $x$ -axis

but,  $x$  &  $y$  axes are perp.

then  $(CD) \perp (KD)$  at  $D$

hence  $\Delta KDC$  is right at hypotenuse  $[KC]$

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