Thus, $\triangle ABC$ is right isosceles at A (having a right angle + 2 equal sides)

And. $BC = \sqrt{2} \times leg$ (hyp of a right isosceles $\triangle$)

$= \sqrt{2} \times AB.$

$= \sqrt{2} \times \sqrt{34}$

$= 2\sqrt{17}$ units of length.

5) a) $\vec{RE} = \vec{RA} + \vec{RB}$ (given)

So, quadrilateral ARBE is a parallelogram.

ABRE is a parm (proved)

So, $\vec{BE} = \vec{RA}$.

For E is be on x-axis, then $y_E = 0$

Now, $y_E - y_B = y_A - y_R$ | $x_E - x_B = x_A - x_R$ |

$y_E + 3 = 2 + 1$ | $x_E + 1 = -4 + 9$ | $E(4,0)$.

$y_E = 0$, | $x_E = 4$

Thus, E is on x-axis.

b). In quadrilateral ABEC we have:

ARBE is a parm (proved)

So, $\vec{RA} = \vec{BE}$

but A is midpt of [RC] (proved)

So, $\vec{RA} = \vec{AC}$.

then, $\vec{AC} = \vec{BE}$ (by comparison)

hence ABEC is a parallelogram

but $\triangle ABC$ is right isosceles at A (proved)

Thus, ABEC is a square (parm + $90°$ + pair of equal adj. sides).

c). $\vec{AR} = \vec{EB}$ (proved)

so, $\|\vec{AR}\| = \|\vec{EB}\|$.

+ ABEC is a square (proved)

So, $EB = CE$

Thus, circle of center E & radius [AR] passes through pts A & B