Calculate a resultant velocity at the center
now the gradient is different at top and bottom and from side to side

\[ K_x = 1 \times 10^{-5} \text{ m/s} \quad K_y = 1 \times 10^{-6} \text{ m/s} \]

Assume linear variation of head

Now Calculate a resultant velocity at the center

\[ \begin{align*}
i_x &= \frac{(33-32)/42 + (29-26)/42}{2} = 0.0476 \\
i_y &= \frac{(33-29)/21 + (32-26)/21}{2} = 0.238 \\
V_x &= 1 \times 10^{-5} (0.05) = 4.76 \times 10^{-7} \text{ m/s} \\
V_y &= 1 \times 10^{-6} (0.24) = 2.38 \times 10^{-7} \text{ m/s} \\
V &= \sqrt{V_x^2 + V_y^2} \text{ m/s}
\end{align*} \]

\[ \text{Angle} = \text{Arctan}(V_y/V_x) \approx 27^\circ \text{ above horizontal} \]
If the water level in piezometers open in aquifer 1 and 2 drop from their solid line levels to the dashed line levels over a square kilometer, how much water is released from the aquifers?
Aquifer 1 = Vol = $[\Delta h_{uncf} \cdot SY] + [\Delta h_{uncf} \text{ (avg thickness)} \cdot S_s]$
\[
= \left[43m \cdot 0.3\right] + \left[43m \cdot (90 + (43/2))m \cdot 4 \times 10^{-3}\right] = 12.9m^3 + 0.144 m^3 \sim 13m^3
\]
\[
13m^3 / m^2 \sim 13,000,000m^3/km^2 \sim 10,500ACFT
\]

Aquifer 2 = Vol = $[\Delta h_{uncf} \cdot S] + [\Delta h_{uncf} \text{ (avg thickness)} \cdot S_s]$
\[
= \left[(15+166+44)m \cdot 6 \times 10^{-5}\right] + \left[42m \cdot 0.1\right] + \left[42m \cdot (208-42/2)m \cdot 6 \times 10^{-5}\right]
\]
\[
= 0.0135m + 4.2m + 0.003m \sim 4.2165 m^3 / m^2 \sim 4,000,000m^3/km^2 \sim 3,200ACFT
\]

WHAT IF IT IS NOT A SIMPLE SHAPE?

average drawdown over the area

Use average drawdown over the area.