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# Distance Drawdown Analysis Formulas

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# List of 10 Distance Drawdown Analysis Formulas

## Distance Drawdown Analysis

### 1) Drawdown across One Log Cycle from Distance Drawdown Graphs given Transmissivity

$$\text{fx } \Delta s_D = 2.3 \cdot \frac{q}{T \cdot 2 \cdot \pi}$$

[Open Calculator !\[\]\(a870788d6ed9b8fd294b7654a8c8526b\_img.jpg\)](#)

$$\text{ex } 0.232945 = 2.3 \cdot \frac{7\text{m}^3/\text{s}}{11\text{m}^2/\text{s} \cdot 2 \cdot \pi}$$

### 2) Drawdown across One Log Cycle given Transmissivity for Inconsistent Units

$$\text{fx } \Delta s = 70 \cdot \frac{q}{T}$$

[Open Calculator !\[\]\(c50c8b7b2cc2cf9ff925edec0ee94c0d\_img.jpg\)](#)

$$\text{ex } 44.54545 = 70 \cdot \frac{7\text{m}^3/\text{s}}{11\text{m}^2/\text{s}}$$

### 3) Pumping Rate from Distance Drawdown Graphs

$$\text{fx } q = T \cdot 2 \cdot \pi \cdot \frac{\Delta s_D}{2.3}$$

[Open Calculator !\[\]\(f60b7a900783ac3fd531bfd9c111be6d\_img.jpg\)](#)

$$\text{ex } 7.001654\text{m}^3/\text{s} = 11\text{m}^2/\text{s} \cdot 2 \cdot \pi \cdot \frac{0.233}{2.3}$$



#### 4) Pumping Rate given Transmissivity for Inconsistent Units from Distance-Drawdown Graphs

$$fx \quad q = T \cdot \frac{\Delta s}{70}$$

[Open Calculator !\[\]\(cbe80b694ebd74fcfe136a095b608235\_img.jpg\)](#)

$$ex \quad 7.000714m^3/s = 11m^2/s \cdot \frac{44.55}{70}$$

#### 5) Storage Coefficient for Inconsistent Units from Distance Drawdown Graphs

$$fx \quad S = T \cdot \frac{S_t}{640} \cdot r_o^2$$

[Open Calculator !\[\]\(3e2231b1ad3ca8da8658228c00dd08e0\_img.jpg\)](#)

$$ex \quad 0.009625 = 11m^2/s \cdot \frac{0.035m}{640} \cdot (4.0m)^2$$

#### 6) Storage Coefficient from Distance-Drawdown Graphs

$$fx \quad S = 2.25 \cdot T \cdot \frac{S_t}{r_o^2}$$

[Open Calculator !\[\]\(0d5ec72f61334709c3fc9450209b754f\_img.jpg\)](#)

$$ex \quad 0.054141 = 2.25 \cdot 11m^2/s \cdot \frac{0.035m}{(4.0m)^2}$$



## 7) Time at which Drawdowns are measured for Storage Coefficient

$$fx \quad s_t = S \cdot \frac{r_o^2}{2.25 \cdot T}$$

[Open Calculator !\[\]\(e78f798d4ea5c530c9db49e7d26e6b95\_img.jpg\)](#)

$$ex \quad 0.035232m = 0.0545 \cdot \frac{(4.0m)^2}{2.25 \cdot 11m^2/s}$$

## 8) Transmissivity for Inconsistent Units from Distance Drawdown Graphs

$$fx \quad T = 70 \cdot \frac{q}{\Delta s}$$

[Open Calculator !\[\]\(05be7c7a8995decd503647c99211f7c2\_img.jpg\)](#)

$$ex \quad 10.99888m^2/s = 70 \cdot \frac{7m^3/s}{44.55}$$

## 9) Transmissivity from Distance Drawdown Graphs

$$fx \quad T = 2.3 \cdot \frac{q}{2 \cdot \pi \cdot \Delta s_D}$$

[Open Calculator !\[\]\(fe3aebe81acea8d45108cd2768939da7\_img.jpg\)](#)

$$ex \quad 10.9974m^2/s = 2.3 \cdot \frac{7m^3/s}{2 \cdot \pi \cdot 0.233}$$

## 10) Transmissivity given Storage Coefficient from Distance Drawdown

$$fx \quad T = \frac{S \cdot r_o^2}{2.25 \cdot s_t}$$

[Open Calculator !\[\]\(899d8b7697d64725bf017d3296cfcf1b\_img.jpg\)](#)

$$ex \quad 11.07302m^2/s = \frac{0.0545 \cdot (4.0m)^2}{2.25 \cdot 0.035m}$$






## Variables Used

- **q** Pumping Rate (*Cubic Meter per Second*)
- **r<sub>o</sub>** Distance from Pumping Well to Point Intersection (*Meter*)
- **S** Storage Coefficient
- **s<sub>t</sub>** Total Drawdown (*Meter*)
- **T** Transmissivity (*Square Meter per Second*)
- **Δs** Drawdown Across One Log Cycle
- **Δs<sub>D</sub>** Drawdown Across Log Cycle



## Constants, Functions, Measurements used

- **Constant:** **pi**, 3.14159265358979323846264338327950288  
*Archimedes' constant*
- **Measurement:** **Length** in Meter (m)  
*Length Unit Conversion* 
- **Measurement:** **Volumetric Flow Rate** in Cubic Meter per Second ( $\text{m}^3/\text{s}$ )  
*Volumetric Flow Rate Unit Conversion* 
- **Measurement:** **Kinematic Viscosity** in Square Meter per Second ( $\text{m}^2/\text{s}$ )  
*Kinematic Viscosity Unit Conversion* 



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