calculatoratoz.com

unitsconverters.com

Force Formulas

Calculators!   **Examples!**   **Conversions!**

Bookmark **calculatoratoz.com**, **unitsconverters.com**

Widest Coverage of Calculators and Growing - **30,000+ Calculators!**
Calculate With a Different Unit for Each Variable - **In built Unit Conversion!**
Widest Collection of Measurements and Units - **250+ Measurements!**

Feel free to SHARE this document with your friends!

Please leave your feedback here...

List of 15 Force Formulas

Force 🔗

1) Brake Clamp Load 🔗

fx $$C = \frac{T}{r_e \cdot \mu_f \cdot n}$$

Open Calculator 🔗

ex $$0.20202N = \frac{25N*m}{9m \cdot 2.5 \cdot 5.5}$$

2) Braking Force on Drum for Simple Band Brake 🔗

fx $$F_{braking} = T_1 - T_2$$

Open Calculator 🔗

ex $$4N = 720N - 716N$$

3) Force on Lever of Simple Band Brake for Anticlockwise Rotation of Drum 🔗

fx $$P = \frac{T_2 \cdot b}{l}$$

Open Calculator 🔗

ex $$32.54545N = \frac{716N \cdot .05m}{1.1m}$$

4) Force on Lever of Simple Band Brake for Clockwise Rotation of Drum 🔗

fx $$P = \frac{T_1 \cdot b}{l}$$

ex $$32.72727N = \frac{720N \cdot .05m}{1.1m}$$

5) Maximum Braking Force Acting at Front Wheels when Brakes are Applied to Front Wheels only 🔗

fx $F_{braking} = \mu_{brake} \cdot R_A$

ex $4.00001N = 0.35 \cdot 11.4286N$

6) Maximum Value of Total Braking Force Acting at Rear Wheels when Brakes Applied to Rear Wheels only 🔗

fx $F_{braking} = \mu_{brake} \cdot R_B$

ex $4.025N = 0.35 \cdot 11.5N$

7) Normal Force for Shoe Brake if Line of Action of Tangential Force Passes above Fulcrum (Anti Clock) 🔗

fx $$Fn = \frac{P \cdot l}{x + \mu_{brake} \cdot a_{shift}}$$

ex $$10.91473N = \frac{32N \cdot 1.1m}{2m + 0.35 \cdot 3.5m}$$

8) Normal Force for Shoe Brake if Line of Action of Tangential Force Passes above Fulcrum (Clockwise) 🔗

fx $$Fn = \frac{P \cdot l}{x - \mu_{brake} \cdot a_{shift}}$$

ex $$45.41935N = \frac{32N \cdot 1.1m}{2m - 0.35 \cdot 3.5m}$$

9) Normal Force for Shoe Brake if Line of Action of Tangential Force Passes below Fulcrum (Anti Clock) 🔗

fx $$Fn = \frac{P \cdot l}{x - \mu_{brake} \cdot a_{shift}}$$

ex $$45.41935N = \frac{32N \cdot 1.1m}{2m - 0.35 \cdot 3.5m}$$

10) Normal Force for Shoe Brake if Line of Action of Tangential Force Passes below Fulcrum (Clockwise) 🔗

fx $$Fn = \frac{P \cdot l}{x + \mu_{brake} \cdot a_{shift}}$$

ex $$10.91473N = \frac{32N \cdot 1.1m}{2m + 0.35 \cdot 3.5m}$$

11) Normal Force Pressing Brake Block on Wheel for Shoe Brake 🔗

Open Calculator 🔗

$$fx \quad Fn = \frac{P \cdot l}{x}$$

$$ex \quad 17.6N = \frac{32N \cdot 1.1m}{2m}$$

12) Tangential Braking Force Acting at Contact Surface of Block and Wheel for Shoe Brake 🔗

Open Calculator 🔗

$$fx \quad F_t = \mu_{brake} \cdot R_N$$

$$ex \quad 2.1N = 0.35 \cdot 6N$$

13) Tangential Braking Force given Normal Force on Brake Block 🔗

Open Calculator 🔗

$$fx \quad F_t = \mu_{brake} \cdot R_N \cdot r_{wheel}$$

$$ex \quad 2.121N = 0.35 \cdot 6N \cdot 1.01m$$

14) Total Braking Force Acting at Front Wheels (when Brakes are Applied to Front Wheels only) 🔗

Open Calculator 🔗

$$fx \quad F_{braking} = m \cdot a - m \cdot g \cdot \sin(\alpha_{inclination})$$

$$ex \quad 4.005343N = 54.73kg \cdot 8.955m/s^2 - 54.73kg \cdot 9.8m/s^2 \cdot \sin(65°)$$

15) Total Braking Force Acting at Rear Wheels when Brakes are Applied to Rear Wheels only 📲

fx $F_{\text{braking}} = m \cdot a - m \cdot g \cdot \sin(\alpha_{\text{inclination}})$

Open Calculator 📲

ex $4.005343N = 54.73kg \cdot 8.955m/s^2 - 54.73kg \cdot 9.8m/s^2 \cdot \sin(65°)$

Variables Used

- **a** Retardation of Vehicle *(Meter per Square Second)*
- **a$_{shift}$** Shift in Line of Action of Tangential Force *(Meter)*
- **b** Perpendicular Distance from Fulcrum *(Meter)*
- **C** Brake Clamp Load *(Newton)*
- **F$_{braking}$** Braking Force *(Newton)*
- **F$_t$** Tangential Braking Force Acting Contact Surface *(Newton)*
- **Fn** Normal Force *(Newton)*
- **g** Acceleration due to Gravity *(Meter per Square Second)*
- **l** Distance b/w Fulcrum and End of Lever *(Meter)*
- **m** Mass of Vehicle *(Kilogram)*
- **n** Number of Friction Faces
- **P** Force Applied at the End of the Lever *(Newton)*
- **R$_A$** Normal Reaction between Ground and Front Wheel *(Newton)*
- **R$_B$** Normal Reaction between Ground and Rear Wheel *(Newton)*
- **r$_e$** Effective Radius *(Meter)*
- **R$_N$** Normal Force Pressing the Brake Block on the Wheel *(Newton)*
- **r$_{wheel}$** Radius of Wheel *(Meter)*
- **T** Brake Torque *(Newton Meter)*
- **T$_1$** Tension in Tight Side of the Band *(Newton)*
- **T$_2$** Tension in the Slack Side of Band *(Newton)*
- **x** Distance b/w Fulcrum and Axis of Wheel *(Meter)*
- **α$_{inclination}$** Angle of Inclination of Plane to Horizontal *(Degree)*

- **μ$_{brake}$** Coefficient of Friction for Brake

- **μ$_f$** Disc Coefficient of Friction

Constants, Functions, Measurements used

- Function: **sin**, sin(Angle)
  Sine is a trigonometric function that describes the ratio of the length of the opposite side of a right triangle to the length of the hypotenuse.
- Measurement: **Length** in Meter (m)
  Length Unit Conversion 🔗
- Measurement: **Weight** in Kilogram (kg)
  Weight Unit Conversion 🔗
- Measurement: **Acceleration** in Meter per Square Second (m/s²)
  Acceleration Unit Conversion 🔗
- Measurement: **Force** in Newton (N)
  Force Unit Conversion 🔗
- Measurement: **Angle** in Degree (°)
  Angle Unit Conversion 🔗
- Measurement: **Torque** in Newton Meter (N*m)
  Torque Unit Conversion 🔗

Check other formula lists

- **Braking Torque Formulas** 🗗
- **Dynamometer Formulas** 🗗
- **Force Formulas** 🗗

- **Retardation of the Vehicle Formulas** 🗗
- **Total Normal Reaction Formulas** 🗗

Feel free to SHARE this document with your friends!

PDF Available in

English Spanish French German Russian Italian Portuguese Polish Dutch

9/30/2024 | 3:58:51 PM UTC *Please leave your feedback here...*