

Piston Displacement Lesson 2 Worksheet

Name

Key

Solve the following using the cubic inch displacement formula and then convert to the indicated unit. Show work and use appropriate units.

1. An V-6 engine block has a bore of 3 inches, a stroke of 4 inches. Calculate the cubic inch displacement in Liters.

$$CID = .7854 \times 3^2 \times 4 \times 6$$

$$CID = 170 \text{ cubic inches}$$

$$170 \text{ in}^3 \times \frac{16.39 \text{ cc}}{1 \text{ in}^3} = 2786.3 \text{ cc}$$

$$2786 \text{ cc} \times \frac{1 \text{ L}}{1000 \text{ cc}} = \boxed{2.8 \text{ L}}$$

2. An V-4 engine block has a bore of 3.25 inches, a stroke of 3 inches. Calculate the cubic inch displacement in Liters.

$$CID = .7854 \times 3.25^2 \times 3 \times 4$$

$$CID = 100 \text{ cubic inches}$$

$$100 \text{ in}^3 \times \frac{16.39 \text{ cc}}{1 \text{ in}^3} = 1639 \text{ cc}$$

$$1639 \text{ cc} \times \frac{1 \text{ L}}{1000 \text{ cc}} = \boxed{1.6 \text{ L}}$$

3. An 4 cylinder engine block has a bore of 4.05 inches, a stroke of 3.25 inches. Calculate the cubic inch displacement in Liters.

$$CID = .7854 \times 4.05^2 \times 3.25 \times 4$$

$$CID = 167 \text{ cubic inches}$$

$$167 \text{ in}^3 \times \frac{16.39 \text{ cc}}{1 \text{ in}^3} = 2737 \text{ cc}$$

$$2737 \text{ cc} \times \frac{1 \text{ L}}{1000 \text{ cc}} = \boxed{2.7 \text{ L}}$$

4. An V-6 engine block has a bore of 4.03 inches, a stroke of 3.125 inches. Calculate the cubic inch displacement in Liters.

$$CID = .7854 \times 4.03^2 \times 3.125 \times 6$$

$$CID = 239 \text{ cubic inches}$$

$$239 \text{ in}^3 \times \frac{16.39 \text{ cc}}{1 \text{ in}^3} = 3917 \text{ cc}$$

$$3917 \text{ cc} \times \frac{1 \text{ L}}{1000 \text{ cc}} = \boxed{3.9 \text{ L}}$$

5. An 6 cylinder engine block has a bore of 3.75 inches, a stroke of 3.5 inches. Calculate the cubic inch displacement in Liters.

$$CID = .7854 \times 3.75^2 \times 3.5 \times 6$$

$$CID = 232 \text{ cubic inches}$$

$$232 \text{ in}^3 \times \frac{16.39 \text{ cc}}{1 \text{ in}^3} = 3802 \text{ cc}$$

$$\frac{3802 \text{ cc}}{1000 \text{ cc}} \times \frac{1 \text{ L}}{1} = \boxed{3.8 \text{ L}}$$

6. An 4 cylinder engine block has a bore of $4\frac{1}{4}$ inches, a stroke of $3\frac{3}{8}$ inches. Calculate the cubic inch displacement in Liters.

$$CID = .7854 \times 4\frac{1}{4}^2 \times 3\frac{3}{8} \times 4$$

$$CID = .7854 \times 4.25^2 \times 3.375 \times 4$$

$$CID = 192 \text{ cubic inches}$$

$$192 \text{ in}^3 \times \frac{16.39 \text{ cc}}{1 \text{ in}^3} = 3147 \text{ cc}$$

$$\frac{3147 \text{ cc}}{1000 \text{ cc}} \times \frac{1 \text{ L}}{1} = \boxed{3.1 \text{ L}}$$

7. An V-6 engine block has a bore of 4.5 inches, a stroke of $3\frac{1}{2}$ inches. Calculate the cubic inch displacement in Liters.

$$CID = .7854 \times 4.5^2 \times 3\frac{1}{2} \times 6$$

$$CID = 334 \text{ cubic inches}$$

$$334 \text{ in}^3 \times \frac{16.39 \text{ cc}}{1 \text{ in}^3} = 5474 \text{ cc}$$

$$\frac{5474 \text{ cc}}{1000 \text{ cc}} \times \frac{1 \text{ L}}{1} = \boxed{5.5 \text{ L}}$$

8. Convert a 6.0 Liter engine to cubic inches.

$$6.0 \text{ L} \times \frac{1000 \text{ cc}}{1 \text{ L}} \times \frac{1 \text{ in}^3}{16.39 \text{ cc}} = \boxed{366 \text{ cubic inches}}$$

9. Convert a 4.5 Liter engine to cubic inches.

$$4.5 \text{ L} \times \frac{1000 \text{ cc}}{1 \text{ L}} \times \frac{1 \text{ in}^3}{16.39 \text{ cc}} = \boxed{275 \text{ cubic inches}}$$

10. Convert a 3.8 Liter engine to cubic inches.

$$3.8 \text{ L} \times \frac{1000 \text{ cc}}{1 \text{ L}} \times \frac{1 \text{ in}^3}{16.39 \text{ cc}} = \boxed{232 \text{ cubic inches}}$$