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MATHEMATICAL MODEL OF PERTALITE AND PERTAMAX GASOLINE FUEL CONSUMPTION ON HONDA REVO MOTORBIKES

Sugiyanto[1]

[1]Mathematics Department, Universitas Islam Negeri Sunan Kalijaga, Yogyakarta, Indonesia
Email: sugiyanto@uin-suka.ac.id

Abstract

Revo 110 is one of the motorbikes produced by PT Astra Honda Motor. Mathematical modeling of this motorbike's fuel consumption with Pertalite and Pertamax produces a linear equation. In the mathematical model, one liter of Pertalite fuel consumption results in a distance of 45.0045 km, while with one liter of Pertamax it produces a distance of 56.2430 km.
Keywords: Mathematical Modeling; Pertalite and Pertamax; Revo 110.

1. INTRODUCTION

The Honda Revo motorbike is a scooter produced by PT Astra Honda Motor in Indonesia. Honda Revo was launched on April 20, 2007. Honda Revo has a cubic centimeter (cc) of 110. Pertalite and Pertamax are gasoline fuels produced by Pertamina Indonesia (Martin & Malley, 2021). Pertalite and Pertamax have octane numbers of 90 and 92 respectively (Puspawan et al, 2021).

2. MATHEMATICAL MODEL OF PERTALITE AND PERTAMAX GASOLINE FUEL CONSUMPTION ON HONDA REVO MOTORBIKES

The Honda Revo motorbike used in this research is the 2009 assembly motorbike. Figure 1 is the motorbike used in this study. The motorbike has the plate number AB-XXXX-AK. In this model, red lights and traffic jams are not taken into account. Pertalite and Pertamax consumption calculations are in the Yogyakarta City area.

Figure 1. Honda Revo Motorbike

Table 1 is Pertalite and Pertamax fuel consumption. At the start of using Pertalite 46.397 km, fill the motorbike tank fully and the motorbike will be fully filled with fuel again at 46.497 km. At a distance of 100 km with Pertalite fuel it costs Rp. 17,000. Pertalite price per liter is Rp. 7,650. This means that for 100 km, Pertalite fuel is used $\frac{17000}{7650} = 2.222$ liter. We can interpret that one liter of Pertalite can go beyond $\frac{100}{2.222} = 45.0045$ km.

At the beginning of using Pertamax, the speedometer position was at 47.025 km. The price per liter of Pertamax is Rp. 9,000. At a distance of 100 km with Pertamax fuel it costs Rp. 16,000. Pertamax fuel for 100 km is $\frac{16000}{9000} = 1.778$ liter. This means that one liter of Pertamax can be exceeded $\frac{100}{1.778} = 56.2430$ km.

Table 1. Fuel Consumption

No.	Fuel	Fuel consumption in one liter (km)
1	Pertalite	45.0045
2	Pertamax	56.2430

Pertalite and Pertamax can be used to refuel Revo motorbikes. We use the speedometer to calculate the fuel consumption of the motor. In this study using a distance of 100 kilometers

to find out how many liters of motor fuel consumption. Pertalite and Pertamax fuel consumed 2,222 liters and 1,778 liters respectively. Table 2 is a description of the parameters in this modeling.

Table 2. Parameters of the Motor Revo Fuel Consumption Model

No.	Symbol	Explanation	Unit
1	s	Distance	km
2	CP	Pertalite Fuel Consumption	liter
3	CQ	Pertamax Fuel Consumption	liter

1. Mathematical model for Pertalite formed

$$(s_0, CP_0) = (0, 0)$$
$$(s_1, CP_1) = (100, 2.222)$$

We get the equation

$$\frac{s - s_0}{s_1 - s_0} = \frac{CP - CP_0}{CP_1 - CP_0}$$

We get

$$CP = 0.02222\, s$$

2. Mathematical model for Pertamax is formed

$$(s_0, CQ_0) = (0, 0)$$
$$(s_1, CQ_1) = (100, 1.778)$$

Kita memperoleh persamaan

$$\frac{s - s_0}{s_1 - s_0} = \frac{CQ - CQ_0}{CQ_1 - CQ_0}$$

We get

$$CQ = 0.01778\, s$$

In brief, the formula for Pertalite and Pertamax fuel consumption is

$$C(s) = \begin{cases} 0.02222\, s, & \text{for Perlalite} \\ 0.01778\, s & \text{for Pertamax} \end{cases}$$

Figure 2 is a graph of the distance to Pertalite and Pertamax Revo 110 motor fuel. Figure 2 uses an online program, namely: https://www.desmos.com/calculator.

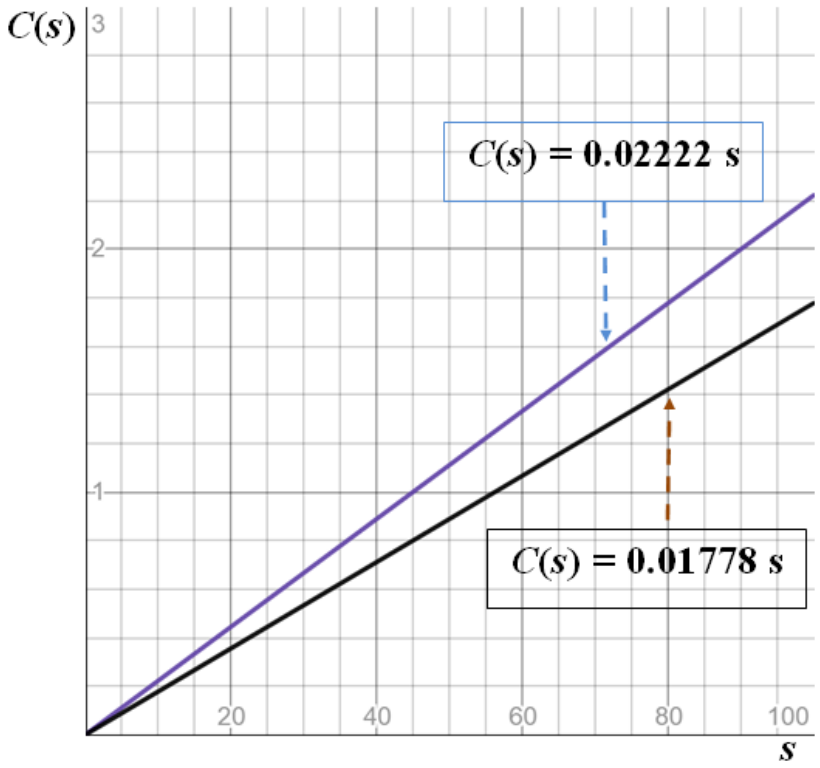

Figure 2. Pertalite and Pertamax Fuel Consumption Curves Over Distance

3. CONCLUSION

Motor Revo 110 is a product of Honda. The Pertalite and Pertamax fuel consumption mathematical models formed with the Revo motor are

$$C(s) = \begin{cases} 0.02222\ s, & \text{for Perlalite} \\ 0.01778\ s & \text{for Pertamax} \end{cases}.$$

4. REFERENCES

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