



hp calculators

HP 35s General applications - Part 3

Other applications

Practice solving problems

- Application 1: True Heading
- Application 2: Thrown object
- Application 3: Gas Pressure



General applications

This training aid will illustrate the application of the HP 35s calculator to several problems in other areas. These examples are far from exhaustive, but do indicate the incredible flexibility of the HP 35s calculator.

Practice solving problems

Application 1: True Heading

Example 1: Before a plane takes off, a preflight plan must be filed indicating the proposed trip. In these plans, the known data are true course (TC), wind direction (WD), wind velocity (WV) and true air speed (TAS). Find the true heading of a planned flight, if TC = 80 degrees, WV = 55 mph, TAS = 180 mph, and the WD is toward 95 degrees.

$$\text{The true heading} = \text{TC} - \text{ASIN}(\text{WV} \times \text{SIN}(\text{WD} - \text{TC}) / \text{TAS})$$

Solution: Place the 35s into degrees mode by pressing **MODE** **1**

In RPN mode: **8 0** **ENTER** **5 5** **ENTER** **9 5** **ENTER** **8 0** **-** **SIN** **1 8 0** **÷**
ASIN **-**

In algebraic mode: **8 0** **-** **ASIN** **5 5** **x** **SIN** **9 5** **-** **8 0** **>** **÷** **1 8 0**
ENTER



Figure 1

Answer: 75.46 degrees.

Application 2: Thrown object

Example 1: If a ball is thrown straight upward with a velocity of 95 feet per second, what is the velocity and height of the object after 2 seconds? Use a value of 32.2 feet per second per second for g.

$$\text{Velocity} = \text{Original Velocity} - g \times \text{time}$$

$$\text{Height} = \text{Original Velocity} \times \text{time} - \frac{1}{2} \times g \times \text{time}^2$$

Solution: In RPN mode: **9 5** **ENTER** **3 2 . 2** **ENTER** **2** **x** **-** (Velocity at t = 2 seconds)

9 5 **ENTER** **2** **x** **0 . 5** **ENTER**
3 2 . 2 **x** **2** **ASIN** **-** (Height at t = 2 seconds)

In algebraic mode: **9 5** **-** **3 2 . 2** **x** **2** **ENTER** (Velocity at t = 2 seconds)

9 5 **x** **2** **-** **0 . 5** **x**
3 2 . 2 **x** **2** **ASIN** **2** **ENTER** (Height at t = 2 seconds)

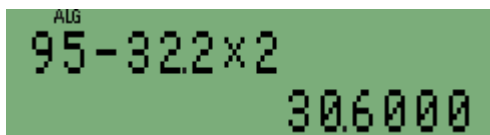


Figure 2

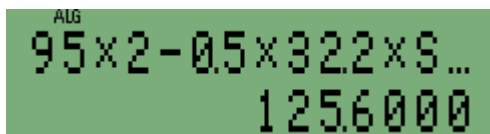


Figure 3

Answer: After 2 seconds, the object is at a height of 125.6 feet and traveling at a velocity of 30.6 feet per second.

Application 3: Gas pressure

Example 1: The internal pressure of a tank of gas is 1100 psi at room temperature (298 degrees Kelvin). What is the internal pressure if the temperature rises by 35 degrees Celsius?

$$\text{New Pressure} = \text{Old Pressure} \times \text{New Temperature} \div \text{Old Temperature}$$

Solution: In RPN mode: **1 1 0 0** **ENTER** **2 9 8** **ENTER** **3 5** **+** **x** **2 9 8**

In algebraic mode: **1 1 0 0** **x** **()** **2 9 8** **+** **3 5** **>** **÷** **2 9 8** **ENTER**

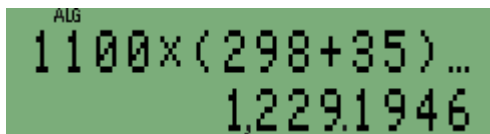


Figure 4

Answer: The new pressure is 1229 psi.