

Place the following into scientific notation:

1. 1 million

2. 0.000345

—
3. 300

Do the following calculations in scientific notation:

4. One ten thousandth of three million

5. Five hundred billion times thirty five thousand

6. Six thousand divided by 300 billion

Unit Conversions:

1 square mile = 640 acres

1 square mile = 259 hectares

7. A 100 square mile area of national forest is how many acres?

8. How many hectares?

Unit Conversions

9. A city that uses ten billion BTUs of energy each month is using how many kilowatt-hours of energy?

$$1 \text{ btu} = 0.000293 \text{ kwh}$$

Unit Conversions

10. If one barrel of crude oil provides six million BTUs of energy, how many BTUs of energy will one liter of crude oil provide?

11. How many calories of energy will one gallon of crude oil provide?

1 barrel oil = 42 gallons

1 gallon = 3.79 liters

1 BTU = 252 calories

Percentages

12. A natural gas power plant is 60% efficient. If one cubic meter of natural gas provides 1000 BTUs of electricity, how many BTUs of waste heat were produced?

Percentages

13. If 35% of a natural area is to be developed, leaving 500 acres untouched, how many acres are to be developed?

Percentages

14. Calculate the percentage growth rate for a country with a population of 6 million: in a year in which it had 100,000 births, 70,000 deaths, 30,000 immigrants, and 50,000 emigrants.

Energy

One BTU is the energy required to raise the temperature of one pound of water by one degree Fahrenheit.

- The density of water is 1 gram/milliliter or approximately 8 pounds/gallon (U.S.).

15. How much energy is required to raise the temperature of one thousand gallons of water by 25°F?

Energy

- One BTU is the energy required to raise the temperature of one pound of water by one degree Fahrenheit.
- The density of water is 1 gram/milliliter or approximately 8 pounds/gallon (U.S.).
- One metric ton is equal to 2,205 lbs of water

16. By how many degrees Fahrenheit can the temperature of one metric ton of water be raised with the addition of 110 thousand BTUs of heat?

Population

17. How many years will it take a population to double at a 6% growth rate?

Walter's Drive

18. Walter drives 120 miles round trip between Cathedral City and Fontana. His Suburban gets 11 miles to the gallon. Over the course of one week, five work days, how many gallons of fuel does he consume?

19. If each gallon of fuel generates 23 lbs of CO_2 how many pounds of CO_2 will Walter generate in one week of commuting between Cathedral City and Fontana?

Walter's Drive Continued

20. If Walter commutes to work 40 weeks each year what is the total annual amount of CO₂ he generates in a year?

21. If one hectare of forest sequesters $1.5 * 10^6$ lbs of CO₂/year how much forest will be required to offset Walter's annual carbon footprint.