[This worksheet is homework. Keep it with your other homework to be included in homework checks.]

1. Gasoline Problem. A local gas station charges $\$ 2.60$ per gallon if you also pay $\$ 4.00$ for a car wash.
(a). Let $x$ be the number of gallons of gas you buy. $\quad \leftarrow$ The variable is defined in words.

Write an expression for the total number of dollars you pay for gas and a car wash.
(b). How much, total, would you pay if you bought:
i. 12 gallons;
ii. 20 gallons?
(c). Suppose that your total bill was $\$ 42.18$. How many gallons of gas did you get?
2. Donuts Problem. Drenchin Donuts sells donuts for $\$ 0.85$ each, plus $\$ 0.15$ for the box in which they come.
(a). Let $x$ be $\qquad$ $\longleftarrow$ Define the variable in words.

Then write an expression for the number of dollars you pay for $x$ donuts.
(b). How much will you pay for:
i. 12 donuts;
ii. 100 donuts?
iii. What assumption must you make about the box in order for the answer to (ii) to be reasonable?
(c). Write an equation stating that the number of dollars you pay is $\$ 13.75$. Then solve the equation to find out how many donuts you get for $\$ 13.75$.
3. Delivery Problem. Bill Dupp's Lumber Yard charges $\$ .50$ for each cubic foot $\left(\mathrm{ft}^{3}\right)$ of sand you buy, plus $\$ 6.00$ to deliver the sand. So the total number of dollars you pay is 0.50 times the number of cubic feet, plus 6 .
(a). Let $x$ be the number of cubic feet. $\longleftarrow$ The variable is defined in words.

Then write an expression for the number of dollars you pay for $x \mathrm{ft}^{3}$ of sand, delivered.
(b). How much would you pay to get $258 \mathrm{ft}^{3}$ delivered?
(c). Write an equation stating that you pay $\$ 17.50$ to get $x \mathrm{ft}^{3}$ of sand delivered. Then solve the equation for $x$.
(d). How much sand could you get, delivered, for $\$ 100$ ?
4. Plumbers' Wages Problem. Drane and Route Plumbing Co. charges $\$ 42$ per hour, plus $\$ 35$ for the service call.
(a). Let $x$ be $\qquad$ $\longleftarrow$ Define the variable in words.

Then write an expression for the number of dollars you must pay if they work for $x$ hours.
(b). How much would you pay for:
i. 3 hours;
ii. $4 \frac{1}{2}$ hours?
(c). Write an equation stating that the amount you pay is $\$ 140$. Then solve the equation to find out how long they worked.
(d). How long did they work if the bill is $\$ 56$ ?
5. Taxi Fare Problem. When you flag a taxi, you get an initial charge of $\$ 3.25$. As the taxi travels, $\$ 1.80$ is added for each mile driven.
(a). Let $x$ be $\qquad$ $\longleftarrow$ Define the variable in words.

Then write an expression for the number of dollars the meter reads after $x$ mi.
(b). How much would you pay to ride:
i. 5 mi ;
ii. 13 mi ?
(c). Write an equation stating that you paid $\$ 18.40$. Then solve the equation to find out how far you rode.
(d). How far could you ride for $\$ 33.20$ ?
6. Dump Truck Problem. Doug Upp must shovel a pile containing $50 \mathrm{ft}^{3}$ of sand into a dump truck. With each scoop, he decreases the size of the pile by $\frac{1}{6} \mathrm{ft}^{3}$.
(a). Let $x$ be the number of scoops he has shoveled.
$\longleftarrow$ Define the variable in words.

Then write an expression for the number of cubic feet of sand left in the pile after $x$ scoops.
(b). How much sand is left after:
i. 12 scoops;
ii. 100 scoops?
(c). Doug takes a rest when $20 \mathrm{ft}^{3}$ of sand remain. Write an equation stating that $20 \mathrm{ft}^{3}$ remain. Then solve the equation to find out how many scoops Doug has shoveled before he rests.
7. Gasoline Consumption Problem. Suppose that the gas tank of a car holds 12 gallons, and that the car uses $\frac{1}{20}$ of a gallon per mile.
(a). Let $x$ be the number of miles the car has gone since the tank was filled. $\longleftarrow$ The variable is defined in words.

Then write an expression for the number of gallons left after $x$ miles.
(b). How many gallons are left after:
i. 100 mi ;
ii. 170 mi ?
(c). Write an equation stating that 5 gallons are left. Then solve it to find out how far the car has gone when 5 gallons remain.
(d). How far has the car gone when it runs out of gas?
8. Food Consumption Problem. According to studies conducted during World War II, a working person consumes 30 fewer calories (cal) per day for each $1^{\circ}$ rise in the Celsius temperature. Suppose that a person consumes 3600 cal per day at $0^{\circ} \mathrm{C}$.
(a). How many calories would the person consume at:
i. $1^{\circ} \mathrm{C}$;
ii. $5^{\circ} \mathrm{C}$;
(b). Let $T$ be the temperature in $\circ C$. Write an expression for the number of calories consumed at $T^{\circ} C$. iii. $T^{\circ} \mathrm{C}$, where $T$ is a variable?
(c). Evaluate the expression you wrote in part (b) if:
i. $T$ is 21 ;
ii. $T$ is -10 .
(d). Write an equation stating that the consumption is 2400 cal. Then solve it to find the temperature.
(e). At what temperature would the person consume 4200 cal?

