What's Going On?

Checking In

Minds on Reading Graphs

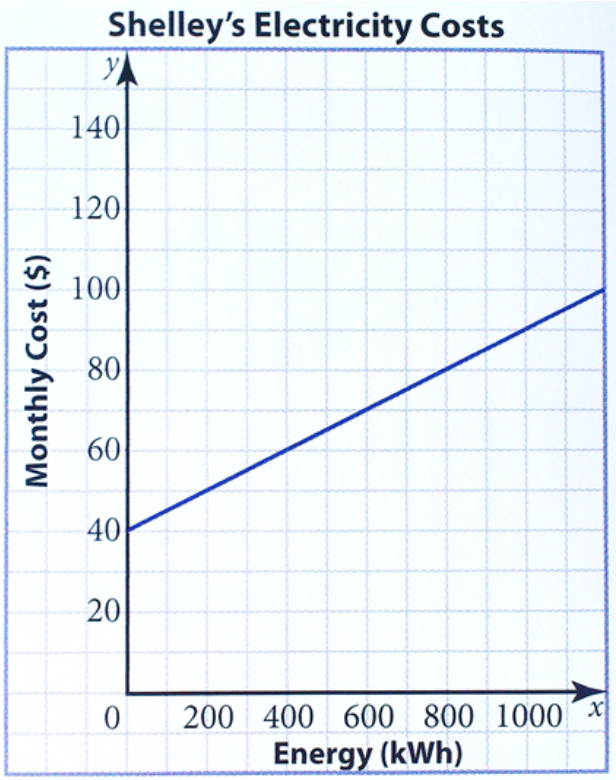
Action! Making Graphs
Making Equations

Consolidation I am linear because...

Learning Goal - I will be able to identify and work with linear models.

Minds on

Reading Graphs



Energy (kWh)

*The independent variable in a graph is always along the horizontal axis (x)

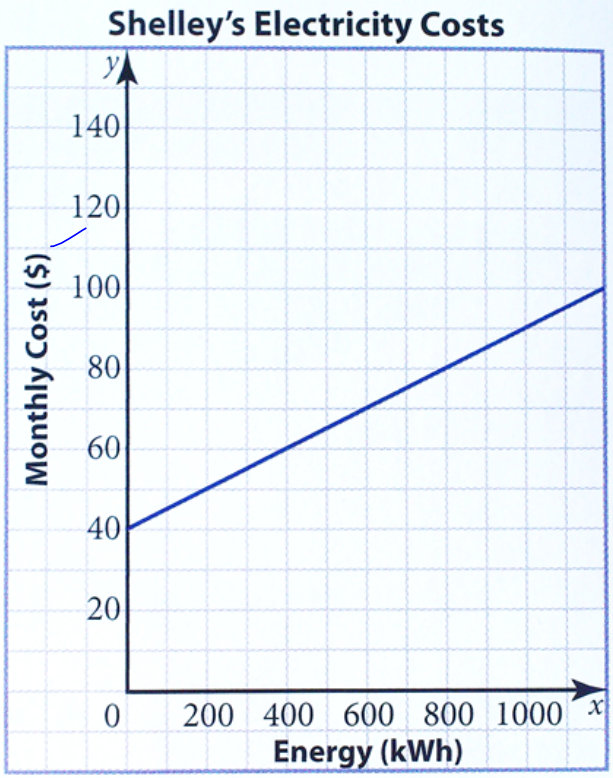
What is the independent variable in this situation?

Energy
Energy (joe)

Y=40
40
40
40
40?
40
40
40
40
40

Minds on

Reading Graphs



Monthly Cost ($)

The dependent variable will always appear along the vertical axis in a graph. (y)

What is the dependent variable in this situation?

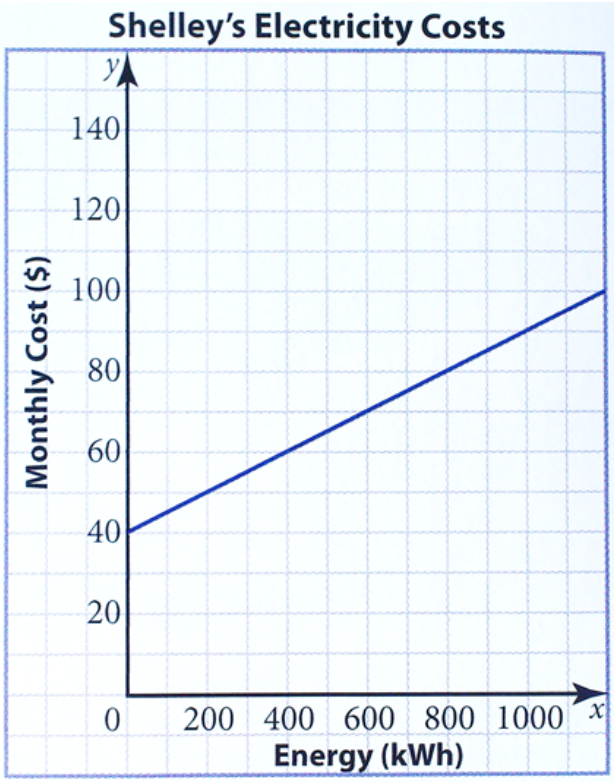
Monthly cost
monthly costs
Monthly cost (joe)
Monthly cost
Monthly cost?
Monthly costs (Steve)
Monthly cost
$

Monthy cost
Monthly
Monthly cost
Monthly cost
Monthly costs
Monthly costs
Monthly cost

Cost

Minds on

Reading Graphs



As the energy consumed increases, the monthly cost increases.

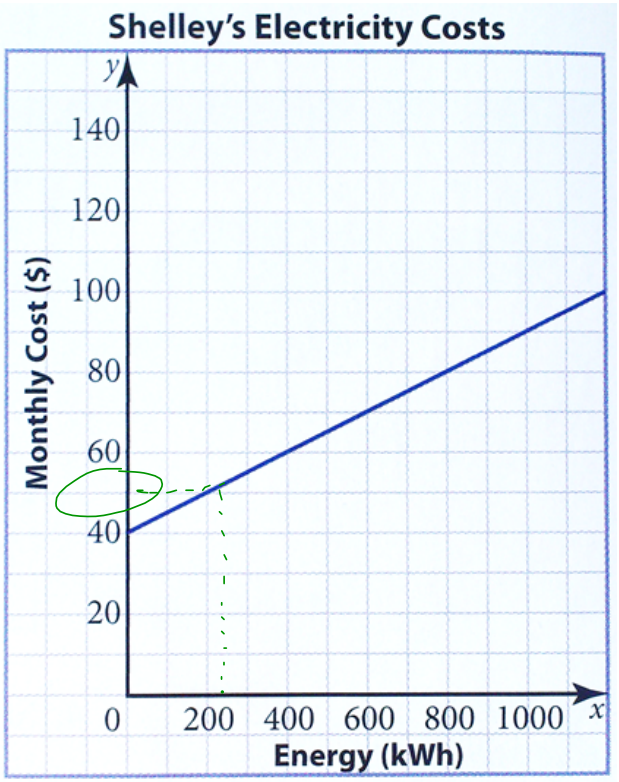
As the I.V. increases the D.V. ____ .

Describe the relationship between monthly cost and energy consumed.

The more energy used, the more the monthly cost will be.
Cont
Monthly cost always increse as the amount of energy you use increse
I don't know :/
The monthly cost starts at 40$ and rises more as energy is consumed
The more energy that Shelley uses the more money she spends per mon
The more energy used the greater the monthly cost
the more energy used, the larger the cost becomes
Flat rate of 40. Monthly cost increases as more energy is being used
Y=1/20x+40
For every $10 you get 200 kWh
For every 200kWhb the cost increases by 10$
Initial cost of $40, and then $10 after that for every 200kWh
Cost=40+energy consumption
For every 10 its optional

Minds on

Reading Graphs



$50

Estimate the cost of 200 kWh.

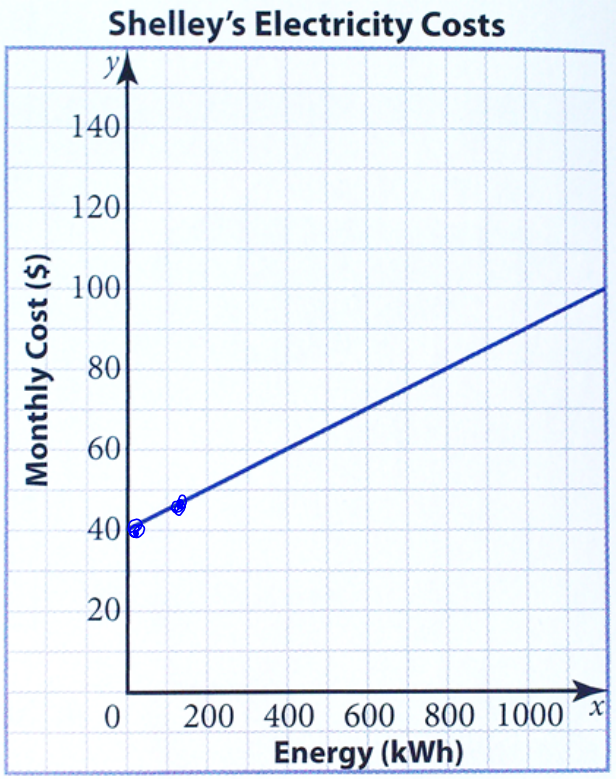
50
50$
50 bucks
50
$50
50
$50
$50.00
$50
$50
50.00$

50
50?
$50
50 cash money skrillla
50

0

Minds on

Reading Graphs



The cost increases by $5.

How does the cost change each time the consumption goes up by 100 kWh?

Increase by 5 to cost,
Cost changes by $5 every 100klw

approx. $10.00
10

$5
The cost goes up $5 for every 100 kWh
The cost only increases by 5$ for every 100kwh
Cost increases by $5 every 110kwh
5
The price goes up by 5 dollars?
Cost goes up by 5 cash money skrilla
The cost changes by 5 each time!
The cost increases by 5$ each time the consumption goes up by 100kWh
The cost increases by $5
Starting at $40, each time 100kWh is used the price raises by $5
The cost changes approximately 10

Minds on

Reading Graphs

$/kWh

The units for the rate of change are always

$$\frac{\text{units of DV}}{\text{units of IV}}$$

What are suitable units for the rate of change of this relationship?

Time and usage
kWh & $?

$/kWh
$/kWh.
$/kWh
$/kwh
$/kWh
$/kWh

5$/100 kwh

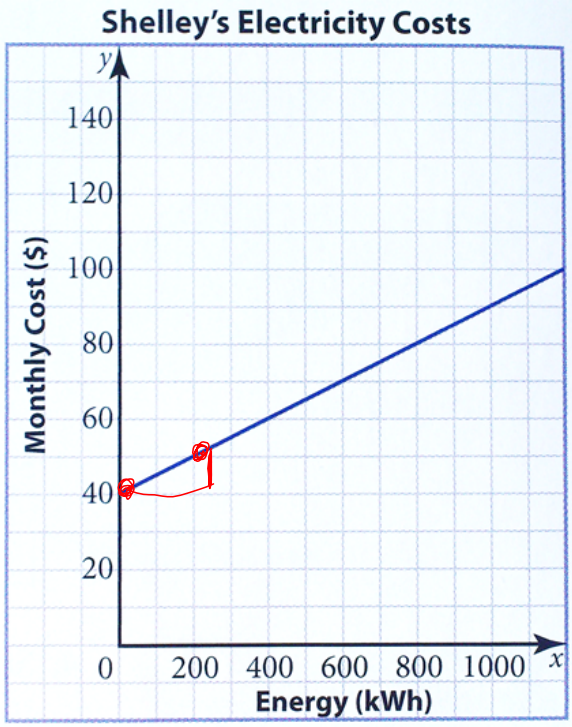
I assume that it would be rise overrun, however. If it isn't, i give inumerable pardons.

If cost is c, and the amount oh kWh is k, them c=10k+40
Hippos.
Y=(10)(200)+40

I don't know
I'm sorry but I'm impaired :(

Minds on

Reading Graphs



Divide the rise between two points by the run between the same two points.

$\frac{10}{200} = \$0.05/kWh$

*units

What is the rate of the change for this situation?

$5/100kWh
$5/100kwh
5$/100kWh
5/100
$5 per 100KWh
$5 per 100 kWh
$5/100kwh
$5/100kWh

$10/100kWh

0.05$/kwh
0.05$/kWh
$10/200kWh = 0.05/kWh
Y=10$/200kWh :)

40/200kwh

1/20

Uuhhmm

$0.05/kWh

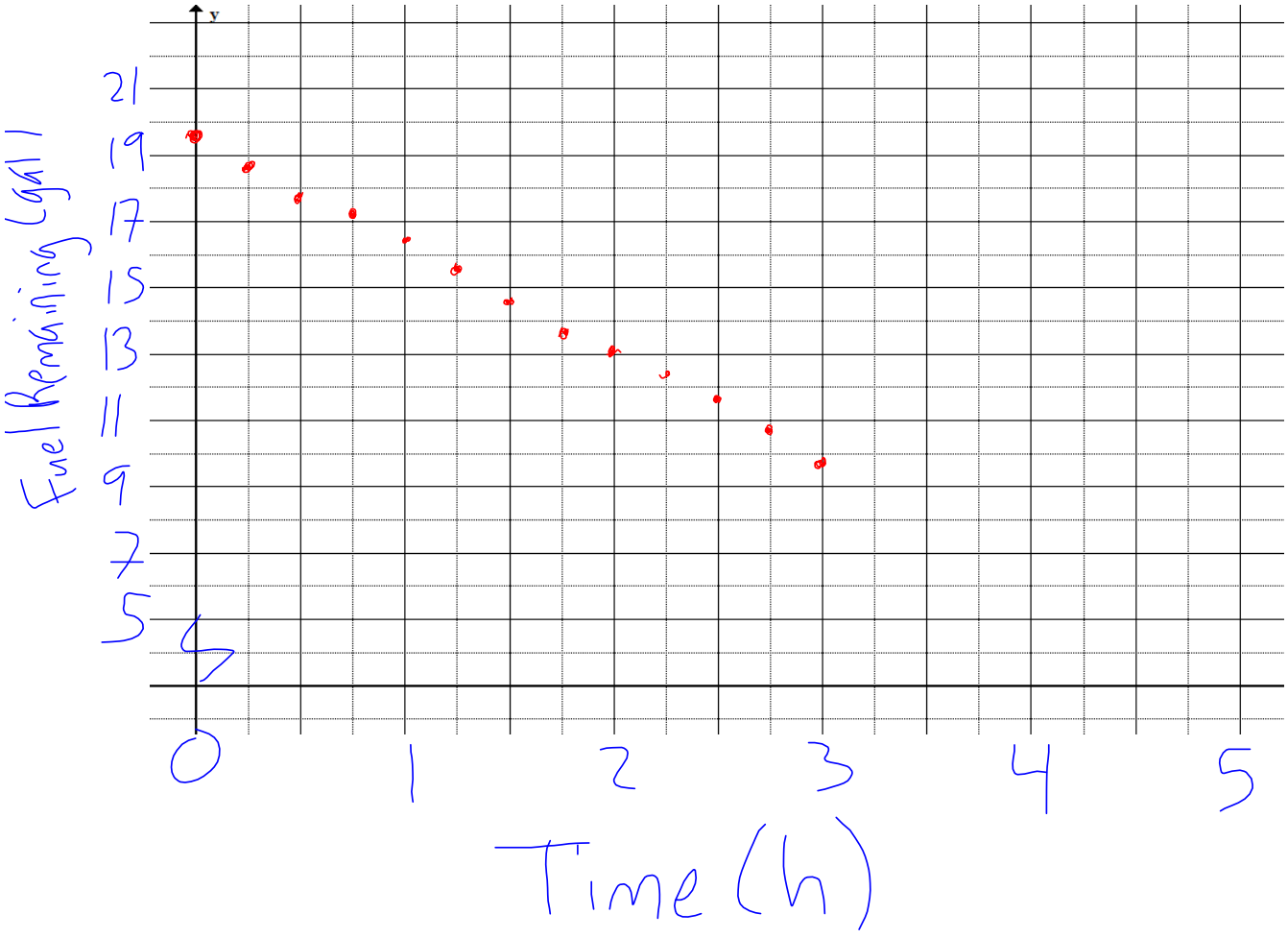
5¢/kWh

Action!

Making Graphs

Time (h)	Fuel Remaining (gal)
0.00	19.50
0.25	18.70
0.50	17.90
0.75	17.10
1.00	16.30
1.25	15.40
1.50	14.60
1.75	13.80
2.00	13.00
2.25	12.20
2.50	11.40
2.75	10.60
3.00	9.80

Draw a graph, with the independent variable on the horizontal axis and the dependent variable on the vertical axis.


y
21
19
17
15
13
11
9
7
5
0
1
2
3
4
5
Fuel Remaining (gal)
Time (h)

Action!

Making Graphs

Time (h)	Fuel Remaining (gal)
0.00	19.50
0.25	18.70
0.50	17.90
0.75	17.10
1.00	16.30
1.25	15.40
1.50	14.60
1.75	13.80
2.00	13.00
2.25	12.20
2.50	11.40
2.75	10.60
3.00	9.80

What are suitable units for the rate of change of this situation?

gal/h

Action!

Making Graphs

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1.75	13.80
2.00	13.00
2.25	12.20
2.50	11.40
2.75	10.60
3.00	9.80

0.25

18.7 − 19.5 = −0.8

−3.2

What is the rate of change of this situation?

$$\frac{-0.8}{0.25} = -3.2 \text{ gal/h}$$

Action!

Making Graphs

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2.00	13.00
2.25	12.20
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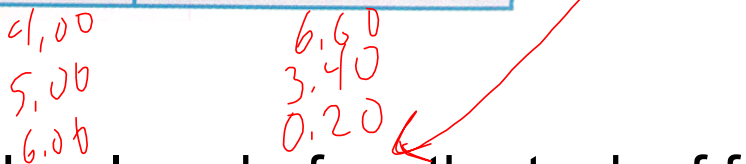
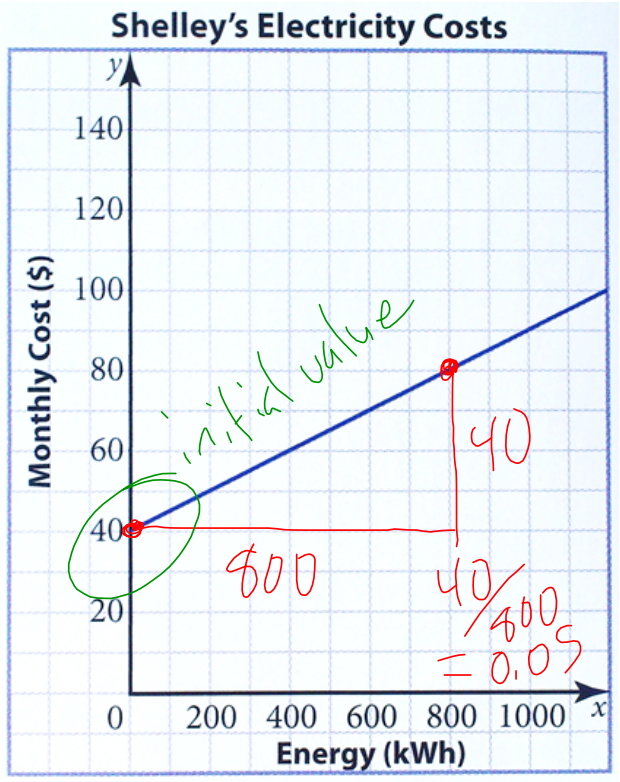
2.75	10.60
3.00	9.80



How long before the tank of fuel runs out?

Action!

Making Equations



$y = mx + b$

$C = 0.05k + 40$

Action!

Making Equations

Time (h)	Fuel Remaining (gal)
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1.00	16.30
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2.00	13.00
2.25	12.20
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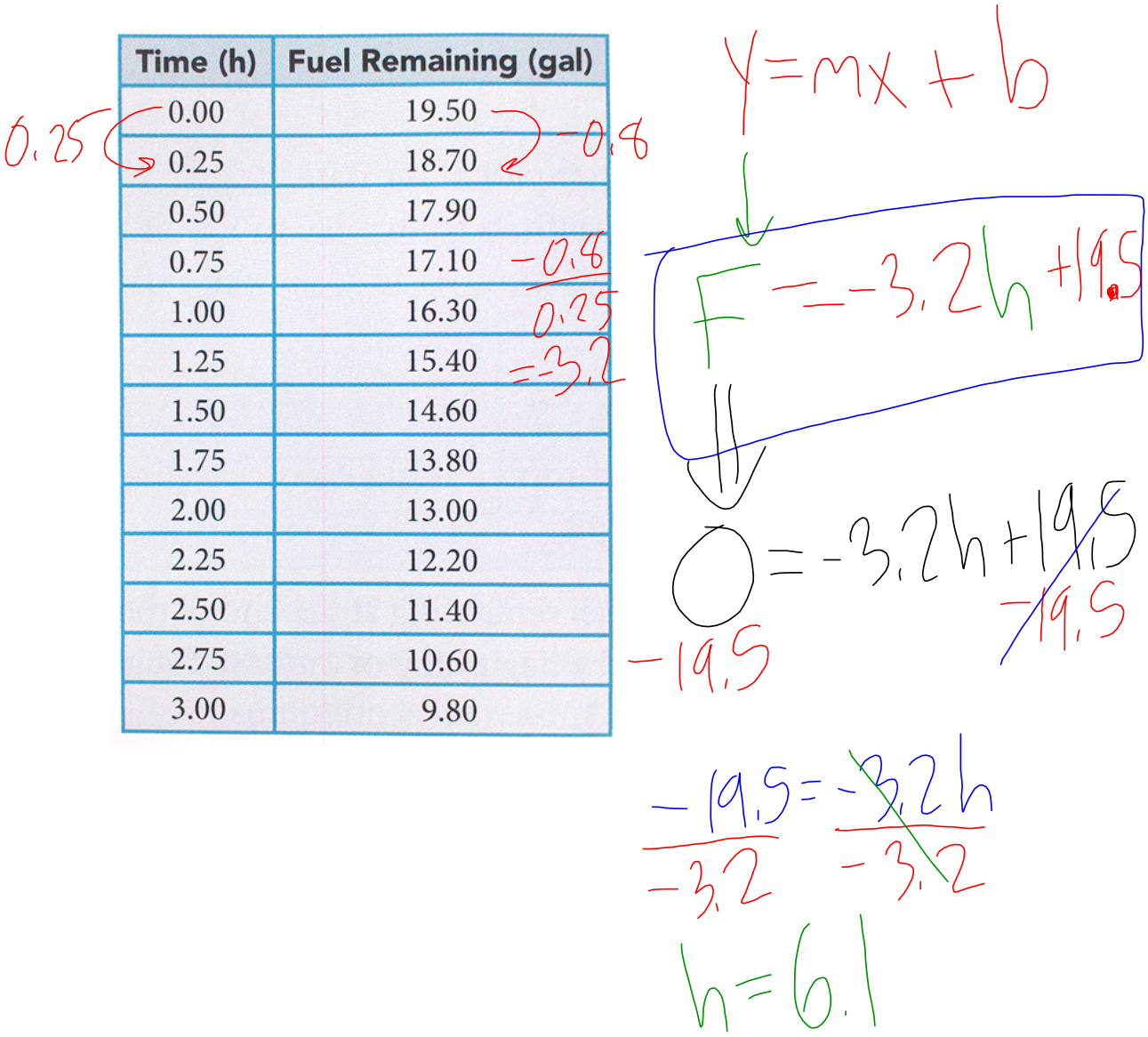


Determine equations to represent each situation.

Consolidation

Linear Models

A linear model can be represented by a linear relation in the form **y = mx + b**.

- **y** represents the dependent variable
- **x** represents the independent variable
- **m** represents the rate of change of the dependent variable with respect to the independent variable
- **b** represents the initial value (the value of the dependent variable when the value of the independent variable is zero)

Consolidation

Linear Models

A linear model shows equal changes over equal intervals.

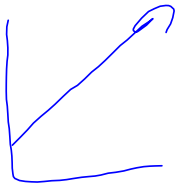
- A straight line can be drawn through points on a graph
- First differences in a table of values are constant

Consolidation

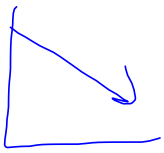
Linear Models

The rate of change of a linear relation can be used to predict future values.

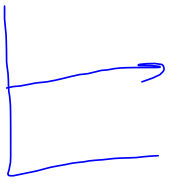
- If the rate of change is **positive**, the quantity is increasing



- If the rate of change is **negative**, the quantity is decreasing

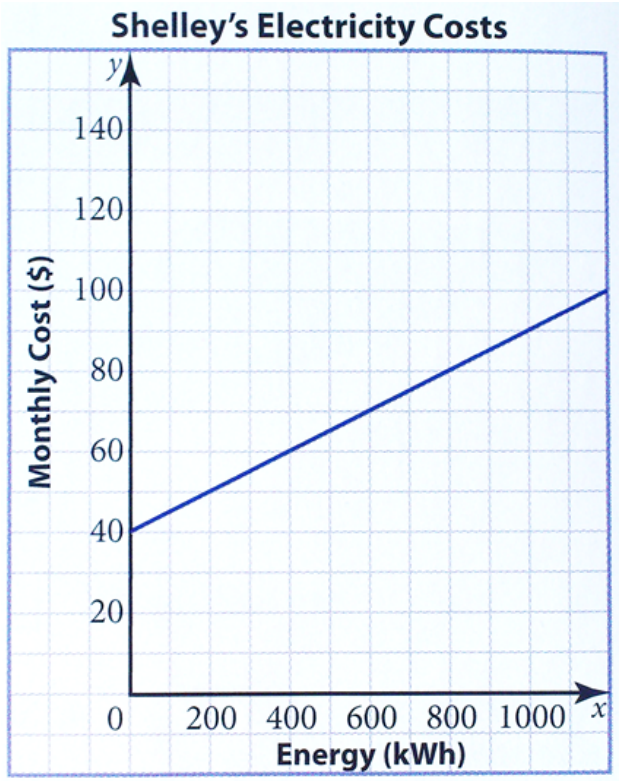


- If the rate of change is **zero**, the quantity is constant



Consolidation

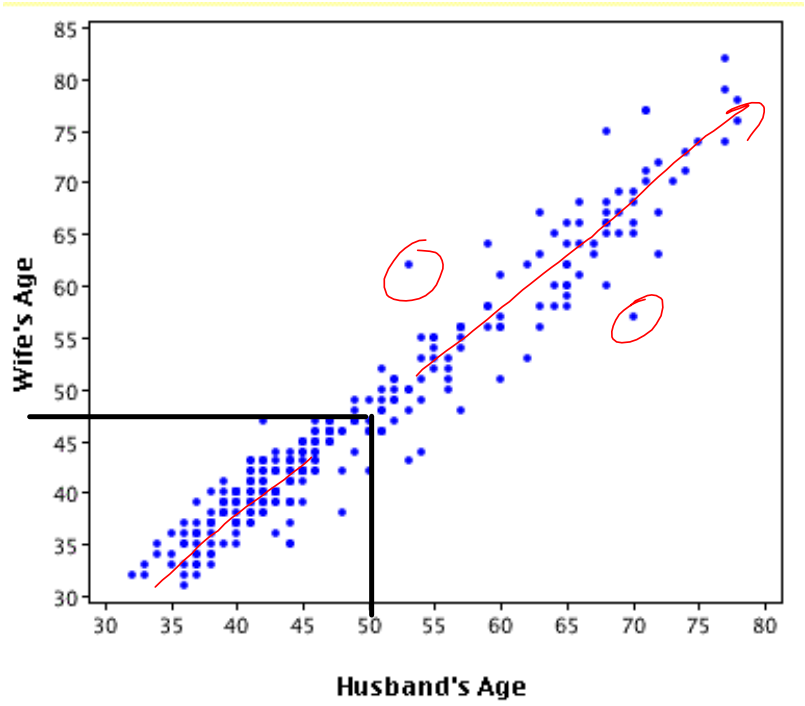
I am linear because...



Data follows a straight line.

Consolidation

I am linear because...



line of best fit can be drawn to fit the data

Consolidation

I am linear because...

Time (h)	Fuel Remaining (gal)
0.00	19.50
0.25	18.70
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1.50	14.60
1.75	13.80
2.00	13.00
2.25	12.20
2.50	11.40
2.75	10.60
3.00	9.80

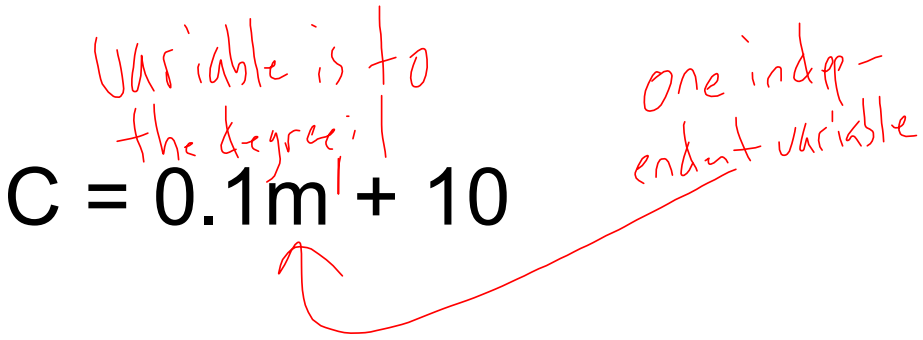
First Differences

−0.8
−0.8
−0.8
−0.8
−0.9
−0.8

First differences are constant or nearly constant

Consolidation

I am linear because...



C represents cost of phone bill

m represents number of minutes used