

#10/a

4. The cost of tires at Speedy-tire is modeled by the following piecewise function:

$$f(x) = \begin{cases} \$85 & \text{per tire for a sedan} \\ \$110 & \text{per tire for a SUV} \\ \$145 & \text{per tire for a truck} \end{cases}$$

Part A. On Monday, Speedy-tire replaces all four tires on 5 sedans, 3 SUVs, and 2 trucks. Find the revenue raised for the sale of the tires.

Part B. If Speedy-tire also charges a flat fee of \$75 per vehicle for the installation, inflation, balancing, and alignment of the new tires, then write an equation for the cost of installing x tires on each type of vehicle:

Sedan:

SUV:

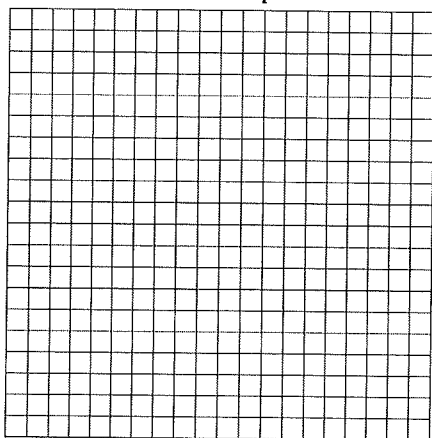
Truck:

Part C. Speedy-tire is running the following promotion for sedans:

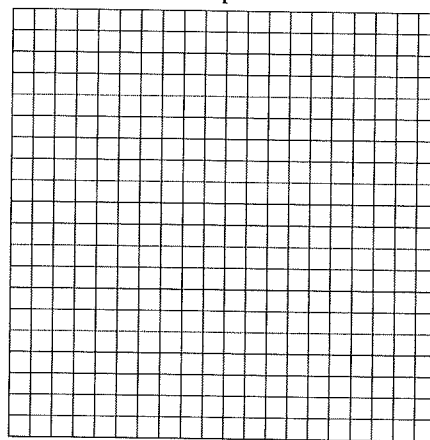
Buy 3 tires and the 4th tire is free AND we will waive the installation fee!!

Create a graph for the price of x tires without the promotion and with the promotion.

Without the promotion



With the promotion



Part D. Write a piecewise function for the **amount of money saved** with the promotion compared to the cost of the tires without the promotion for x tires. Remember that the installation fee becomes free once the third tire is purchased.

$$f(x) = \begin{cases} \$0 & \text{if 1 tire is purchased} \\ \rule{1.5cm}{0.4pt} & \\ \rule{1.5cm}{0.4pt} & \end{cases}$$

1016

5. Part A. Balloon One starts with 100 cubic cm of air. Air is being added at 10 cubic cm per second. Write an equation for the total air in the balloon after t seconds.

$$A_1 =$$

Part B. Balloon Two starts with 200 cubic cm of air. Air is being let out at 10 cubic cm per second. Write an equation for the total air in the balloon after t seconds.

$$A_2 =$$

Part C. At what time will the balloons have the same amount of air AND how much air is in the balloons at this time?

Part D. Balloon One will burst if the amount of air inside exceeds 180 cubic cm. Will Balloon One burst before or after Balloon Two is completely empty?

6. The preferences of Males and Females are shown in the table below:

	Prefer Walking	Prefer Biking	Total
Males	28	40	68
Females	14	18	32
Total	42	58	100

A: What percent of people prefer biking?

B: What percent are male?

C: What percent of females prefer walking?

D: What percent of people preferring biking are male?

E: Which gender has a stronger preference for biking?

4. The cost of tires at Speedy-tire is modeled by the following piecewise function:

$$f(x) = \begin{cases} \$85 & \text{per tire for a sedan} \\ \$110 & \text{per tire for a SUV} \\ \$145 & \text{per tire for a truck} \end{cases} \begin{matrix} \times 4 = 340 \text{ per car} \\ \times 4 = 440 \\ \times 4 = 580 \end{matrix}$$

Part A. On Monday, Speedy-tire replaces all four tires on 5 sedans, 3 SUVs, and 2 trucks. Find the revenue raised for the sale of the tires.

$$5(340) + 3(440) + 2(580) = 4180$$

* Part B. If Speedy-tire also charges a flat fee of \$75 per ~~car~~^{vehicle} for the installation, inflation, balancing, and alignment of the new tires, then write an equation for the cost of installing x tires on each type of vehicle:

Sedan: $85x + 75$

SUV: $110x + 75$

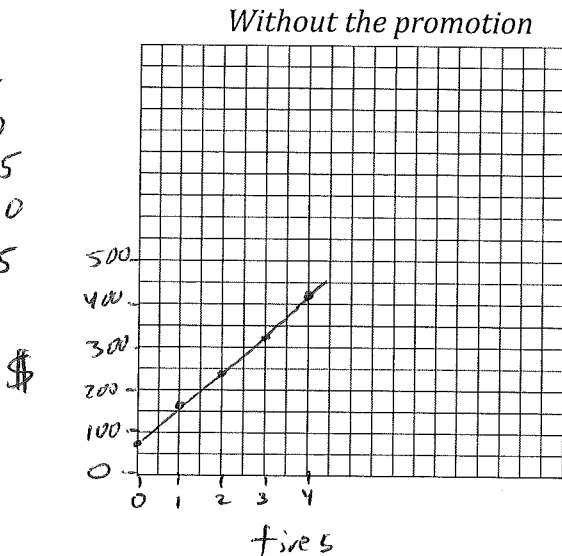
Truck: $145x + 75$

Part C. Speedy-tire is running the following promotion for sedans:

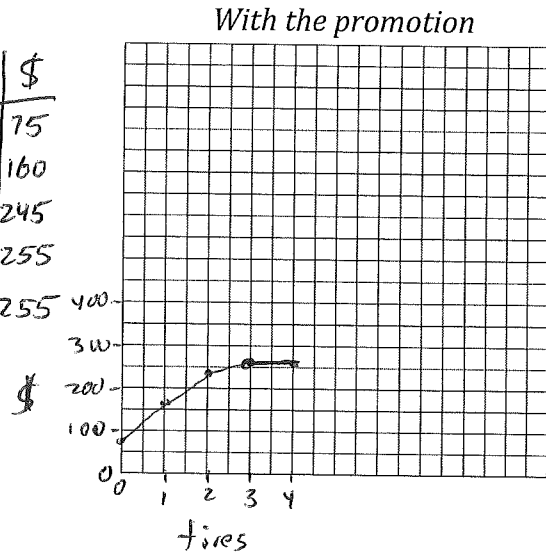
Buy 3 tires and the 4th tire is free AND we will waive the installation fee!!

Create a graph for the price of x tires without the promotion and with the promotion.

x	\$
0	75
1	160
2	245
3	330
4	415



x	\$
0	75
1	160
2	245
3	255
4	255



* Part D. Write a piecewise function for the **amount of money saved** with the promotion compared to the cost of the tires without the promotion for x tires. Remember that the installation fee becomes free once the third tire is purchased.

$$f(x) = \begin{cases} 0 & \text{if 1 tire is purchased} \\ 0 & \text{if 2 tires} \dots \\ 75 & \text{if 3 tires} \dots \\ 160 & \text{if 4 tires} \end{cases}$$

5. part A. Balloon One starts with 100 cubic cm of air. Air is being added at 10 cubic cm per second. Write an equation for the total air in the balloon after t seconds.

$$A_1 = 100 + 10t$$

Part B. Balloon Two starts with 200 cubic cm of air. Air is being let out at 10 cubic cm per second. Write an equation for the total air in the balloon after t seconds.

$$A_2 = 200 - 10t$$

Part C. At what time will the balloons have the same amount of air AND how much air is in the balloons at this time?

$$100 + 10t = 200 - 10t$$

$$20t = 100$$

$$t = 5$$

$$100 + 10(5) = 150$$

A.T.Q.: At $t = 5$ seconds, both will have 150 cubic cm of air.

Part D. Balloon One will burst if the amount of air inside exceeds 180 cubic cm. Will Balloon One burst before or after Balloon Two is completely empty?

$$180 = 100 + 10t$$

$$80 = 10t$$

$$8 = t$$

$$0 = 200 - 10t$$

$$10t = 200$$

$$t = 20 \text{ seconds}$$

A.T.Q.: Balloon One will burst at $t = 8$ seconds which is before Balloon Two is empty, which is at 20 seconds.

6. The preferences of Males and Females are shown in the table below:

	Prefer Walking	Prefer Biking	Total
Males	28	40	68
Females	14	18	32
Total	42	58	100

A: What percent of people prefer biking?

$$\frac{58}{100} = .58 \quad 58\%$$

B: What percent are male?

$$\frac{68}{100} = .68 = 68\%$$

C: What percent of females prefer walking?

$$\frac{14}{32}$$

$$\frac{14}{32} = .4375 \quad 43.75\%$$

D: What percent of people preferring biking are male?

$$\frac{40}{58}$$

$$\frac{40}{58} = .6897 \quad 68.97\%$$

E: Which gender has a stronger preference for biking?

$$\text{Prefer Biking given Male: } \frac{40}{68} = .5882 \quad 58.82\%$$

$$\text{Prefer Biking given Female: } \frac{18}{32} = .5625 \quad 56.25\%$$

A.T.Q.: A greater percent of men prefer biking to walking than women.

Answer the Question

19. **GRAPH** The Western High soccer team is washing cars to raise money for a trip to a tournament. During one previous car wash, the team charged \$5 and washed 44 cars. At another car wash, they charged \$10 and washed 24 cars. Assume there is a linear relationship between the amount they charge and the number of cars they wash.

Write an equation for the number of cars they wash, x , in terms of the price they charge, p .

Solve that equation for p . _____

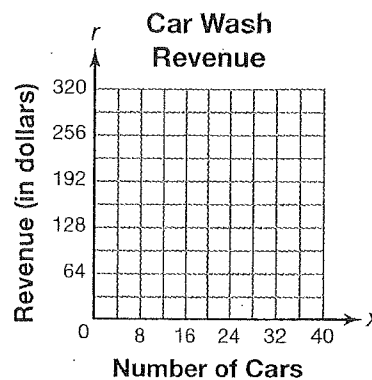
Write an equation for the total amount of money, r , that they take in if they wash x cars.

Graph your equation for r on the coordinate plane.

What is the greatest amount of money that the team could raise?

How many cars must they wash to raise that much money?

At what price will they raise that money? _____



20. **APPLY** Huma is making a wooden frame for a picture that is 10 inches by 12 inches. The entire picture will be visible inside the frame. The frame's width will be the same all the way around.

Write an expression for the length of the frame, including the photo. _____

Write an expression for the height of the frame, including the photo. _____

Huma plans to paint the frame blue (not including the picture inside.) Write an equation for the area of the front of the picture frame that she must paint. _____

#102b
Yes

Use the geometric sequence below for questions 15–17.

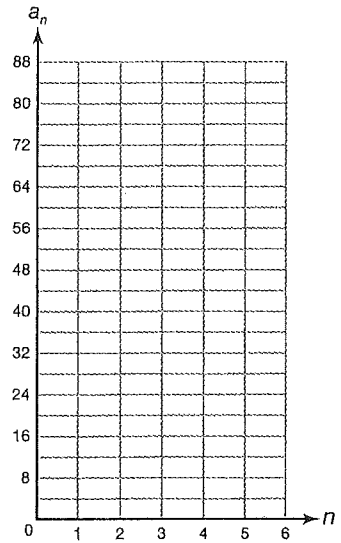
80, 40, 20, 10, ...

15. Write an explicit formula in terms of n to show how to find the n th term in this sequence.

16. Plot points (n, a_n) on the grid on the right to represent the first six terms in the sequence.

Find the average rate of change between each adjacent pair of points.

17. Think of this sequence as a function. What type of function is it? What are its domain and its range? Explain your thinking.



18. **SHOW** A petri dish contains 4 viruses. Each hour, the number of viruses increases, as shown in the table. The population change can be modeled by a geometric sequence. Write a recursive formula and an explicit formula that can model this sequence. Use the formulas to predict how many viruses will be in the dish by the 7th hour.

Hour (n)	Population (a_n)
1	4
2	12
3	36
4	108
5	324

recursive formula: _____

explicit formula: _____

$a_7 =$ _____