

**STUDENT MATERIALS**  
**QUESTIONS 1-2**

Solve the following problems. Please show any work.

**Equations for Entertainment**

You and two friends are visiting the Wally World Amusement Park. They have a special pricing system where the admission cost depends on the visitor's age.

The pricing equation for the park's admission includes a \$5 fee for anyone entering the park. It also includes an additional dollar amount that is 2.5 times the visitor's age.

The total of these is equal to the admission price.

1. Create an equation that represents their pricing using the variable  $p$  for admission price and the variable  $a$  for the visitor's age.

Equation:  $5 + 2.5a = p$

Explain why you set up your equation this way and how it can be used to calculate the admission price. Choose your age to show the calculation.

Because there is a \$5 fee for everyone, the 2.5 is the age of the person.  
we add the 5 to the 2.5 times the age to get the admission price.

2. You and your friends are 10, 12, and 13 years old. You also have an older sibling chaperoning who is 22 years old. Use your equation from the prior question to calculate the admission price for each person in your group.

Age	10	12	13	22
Admission Price	30	35	37.5	60

Show your calculations below:

$25 + 2.5 \cdot 10 = 5 + 25 = 30 = p$   
 $5 + 2.5 \cdot 12 = p$   
 $5 + 30 = p$   
 $35 = p$

$5 + 2.5 \cdot 12 = p$   
 $5 + 30 = p$   
 $35 = p$

$5 + 2.5 \cdot 13 = p$   
 $5 + 32.5 = p$   
 $37.5 = p$

## QUESTION 3

3. While you are in line waiting for a ride, you overhear people in front of you explaining how expensive their admission price was. One mentions a price of \$70 and the other says the price was \$80.

Use your equation from the first question to calculate the age for an admission price of \$70 and an admission price of \$80.

Show your work below:

$$\begin{array}{r} 5 + 2.5A = 70 \\ -5 \quad -5 \\ \hline 2.5A = 65 \\ \frac{2.5}{2.5} \quad \frac{65}{2.5} \\ \hline A = 26 \end{array}$$

$$\begin{array}{r} 26 \cdot 2.5 = 65 \\ 65 + 5 = 70 \end{array}$$

$$\begin{array}{r} 5 + 2.5A = 80 \\ -5 \quad -5 \\ \hline 2.5A = 75 \\ \frac{2.5}{2.5} \quad \frac{75}{2.5} \\ \hline A = 30 \end{array}$$

Admission Price	\$70	\$80
Age	26	30

Do you feel like this is a fair pricing model? Explain why or why not.

No because different people are paying more money than others for the same experience

If you were in charge of admission costs, what type of pricing equation would you use? Use the variable  $p$  for admission price and explain other variables you would use. Explain how it would calculate the total cost for a given age.

I would do  $15 + 1.5A = p$  but everything else inside would be free. There would be \$15 for admission fee and your age times 1.5 to get the total.

**QUESTIONS 4-5**

4. Your friend sees a sign for a special wristband called a Fast Pass. This is a special pass that lets you move to the front of the line for any ride you visit. One friend has a coupon for \$18 off the price. The other has a coupon for a 15% discount off the price.

At the Fast Pass counter, the worker tells you the discount for each coupon will be the same amount. Use this information to set up and solve an equation to find the price for the Fast Pass. Using the variable  $p$  for price, the \$18 off coupon can be expressed as  $p - 18$ . The 15% off coupon takes  $1.00 - 0.15$  or  $0.85$  of the original price. This can be expressed as  $0.85p$ .

Coupon: \$18 off Expression:  $p - 18$

Coupon: 15% off Expression:  $0.85p$

Fast Pass Price  $p$ : 120

$$\begin{array}{r}
 p - 18 = 0.85p \\
 -0.85p \quad -0.85p \\
 \hline
 0.15p - 18 = 0 \\
 +18 \quad +18 \\
 \hline
 0.15p = 18 \\
 \hline
 p = 120
 \end{array}$$

5. You and your friends decide to purchase the Fast Pass and have a race against your older brother who is chaperoning. With the Fast Pass, you and your friends can ride 7.4 rides per hour. Your brother has the Fast Pass and can ride 8.2 rides per hour, but starts half an hour later.

The number of rides per hour times hours equals total rides. Using the variable  $t$  for time (in hours) the expression for each would be:

**You and your friends: 7.4 rides per hour**

**Total rides expression:  $7.4t$**

**Brother: 8.2 rides per hour starting  $\frac{1}{2}$  hour later**

**Total rides expression:  $8.2(t - 0.5)$**

Set up an equation and solve to see how long it will take your brother to catch up and ride an equal number of rides.

Show your work below:

Time when rides will be equal: 3.125

If you will only be at the amusement park for 4 hours after buying the pass, who will be the winner of the race? Support your explanation by determining the number of rides for each.

$$\begin{array}{r}
 7.4t = 8.2(t - 0.5) \\
 7.4t = 8.2t - 4.1 \\
 -7.4t \quad -7.4t \\
 \hline
 0 = 0.8t - 4.1 \\
 +4.1 \quad +4.1 \\
 \hline
 4.1 = 0.8t \\
 \hline
 t = 5.125
 \end{array}$$

You will win!  
 Your brother will take 5 hours to catch up