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.

   I did it this way because the $5 fee plus 2.5 times their age equals 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:

$(22 \cdot 2.5 + 5)$
$55 + 5 = 60$

$(13 \cdot 2.5) + 5$
$32.5 + 5 = 37.5$

$(12 \cdot 2.5) + 5$
$30 + 5 = 35$

$(10 \cdot 2.5) + 5$
$25 + 5 = 30$

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:

$(2.5 \cdot a) + 5 = 70$
$-5 \quad -5$
$\frac{2.5a}{2.5} = \frac{65}{2.5}$

$(2.5 \cdot a) + 5 = 80$
$-5 \quad -5$
$\frac{2.5a}{2.5} = \frac{75}{2.5}$ $a = 30$

Admission Price	$70	$80
Age	26	30

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

I do not, because these people are only four years apart, and one has to pay ten dollars more.

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.

a = adult e = elderly
p = admission price f = fee k = kid i = infant

I would do a certain amount for adults, kids, over 50 year olds, and free for infants, because now everyone will pay a fair price.

ex: $p = f + a$ $p = f + e$
$p = f + k$
$p = f + i$

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 0.85*p*.

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

   Coupon: 15% off Expression: 0.85*p*

   Fast Pass Price *p*: $120

   $p - 18 = 0.85p$
   $+18 \quad +18$
   $p = 0.85p + 18$
   $-0.85p \quad -0.85p$
   $0.15p = 18$
   $\frac{0.15p}{0.15} = \frac{18}{0.15}$
   $p = 120$

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: 7.4*t***

   Brother: 8.2 rides per hour starting ½ 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: 5.125

   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.

   $7.4t = 8.2(t - 0.5)$
   $7.4t = 8.2t - 4.1$
   $-7.4t \quad -7.4t$
   $0 = 0.8t - 4.1$
   $+4.1 \quad +4.1$
   $\frac{4.1}{0.8} = \frac{0.8t}{0.8}$
   $5.125 = t$

   me and my friends would be the winners, as we are only at the amusement park for four hours not five or more.