Mr. Tu's Excellent Examples

Module 4

Costume Designer

Applying Lesson 4.1

1. In costume design as in many businesses, estimating with money is very important in order to do fast budgeting. Round the following amounts to the nearest dollar.

    $4.28 $12.56 $13.82 $9.31

    $4   **$13**   **$14**   **$9**

2. Small and inexpensive items such as sequins, rhinestones and buttons are often purchased in large quantities. The cost of the individual item is usually so small that the price is carried out to a decimal place smaller than one cent. The costume designer needs 10,000 buttons. She has found one supplier that sells them for $0.036 cents per button and another supplier that sells them for $0.0309 per button. Which price is lower? Write an inequality to show your answer.

    .036 > .0309

    The lower price is $0.0309 cents.

Applying Lesson 4.2

1. A costume designer has a contract to make dresses for a large dance troupe of 20 dancers. She estimates she will need 12,000 rhinestones. One supplier says the price is $\frac{1}{2}$ cent each, and another supplier says that the cost is .52 cents each. Write both numbers as decimals in an inequality to show which price is more expensive.

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.52 cents > .50 cents

The $\frac{1}{2}$ cent price is lower.

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2. A costume designer has a contract to create costumes for a play. She will be paid $1,000 plus the cost of materials. The client told the designer she could add $\frac{1}{4}$ the cost of the materials to her cost for materials to offset purchasing the materials with her own money. When the written agreement was presented for a signature, it read "material cost + 20%." Is the written agreement a better or worse deal than what the client stated? Use decimals to show which amount is a higher mark-up.

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.25 > .20

The mark-up amount in the written agreement is less than the mark-up amount stated by the client.

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Applying Lesson 4.3

1. A costumer designer has a budget to create 30 identical costumes for a movie. She has budgeted $135 per costume for materials and labor. The cost of the fabric is $60.75 per costume. The cost of the accessories is $17.40 per costume, and the cost of labor is $30.82 per costume. Estimate the cost per costume and how much the cost is running above or below her budget. Round to the nearest dollar.

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$61 + $17 + $31 = $109

$135 - $109 = $26

The cost for each costume is approximately $26 less than she budgeted.

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2. A costume designer budgeted $32.50 per yard for fabric to make costumes. She found a supplier who would sell her the fabric for $29.76 per yard. If she purchases the fabric from the supplier, how much less is each yard of fabric?

$$\begin{array}{r} \$32.50 \\ - \ \$29.76 \\ \hline \$ \ \ 2.74 \end{array}$$

The fabric would be $2.74 per yard less.

Applying Lesson 4.4

1. A costume is going to use 1,000 sequins. The cost per sequin is $0.035. How much will the sequins for the costume cost?

$0.035 x 1,000 = $35

The sequins for the costume will cost $35.

2. A costume designer is scheduled to make 30 costumes for a play. Each costume will take 7.5 yards of fabric at $22.75 per yard. How much will the fabric cost for each costume?

$$\begin{array}{r} \$22.75 \\ X \ \ \ 7.5 \\ \hline 170.625 \end{array}$$

The fabric will cost $170.63 for each costume.

Applying Lesson 4.5

1. A costume designer spent $375 on materials to complete 24 costumes. What was the average material cost per costume?

$375 ÷ 24 = $15.625
The average material cost is $15.63 per costume.

2. A costume designer added up the bills for materials she purchased to make costumes. The total was $888.25. The materials were used to make 17 costumes. What was the total cost for the costumes?

$$\$888.25 \div 17 = \$52.25$$
The average cost was $52.25 for each costume.

Applying Lesson 4.6

1. One dozen equals twelve and one gross equals twelve dozen. What exponential expression would represent 12 gross of buttons?

$$\text{One dozen} = 12^1$$
$$\text{Gross} = 12^2$$
$$\text{12 Gross} = 12^3$$

The exponential expression for 12 gross is 12^3.

2. A new play opened in New York and about 100 people attended the first night. The producer expected the attendance to double each night for the next three nights. Write and solve a multiplication expression using exponents to show what he expects the attendance to be on the fourth night.

$$100 \times 2^3 = 800$$

The producer expects the attendance to be 800 people on the fourth night.

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Applying Lesson 4.7

1. An electrical engineer has completed a study on the anticipated electricity consumption in a Broadway production with a dazzling light show. His study concludes that the show will consume approximately 9.123×10^6 watts/hour of electricity per show. Is this number written in scientific notation?

Yes, the number is written in scientific notation.

2. Write 9.123×10^6 watts/hour in standard form.

9,123,000 watt/hours

3. To convert watts/hour to kilowatt hours, divide by 1,000. If each show uses 9,123,000 watts/hour, how many kilowatt hours will each show consume?

$$9,123,000 \div 1,000 = 9,123$$

Each show is estimated to consume 9,123 kilowatt hours.

4. The producer of the show pays an average of $0.11 per kilowatt hour for electricity. If each show uses 9,123 kilowatt hours, what is the electricity cost for each show?

$0.11 x 9,123 = $1,003.53

The electricity cost for each show is $1,003.53.