A

Rolling In Sales

A local clothing store decides to offer a unique sales promotion based on the sum of two standard numbered cubes.

The cubes are rolled and the numbers shown on each cube are added together. The sum of the numbers is your percentage discount.

The current price of one outfit is $110.00

1. a) Explain how you would determine the lowest percentage discount and the highest percentage discount.

lowest 1+1=2 → The lowest that you can get is 2

highest 6+6=12 → The highest that you can get is 12.

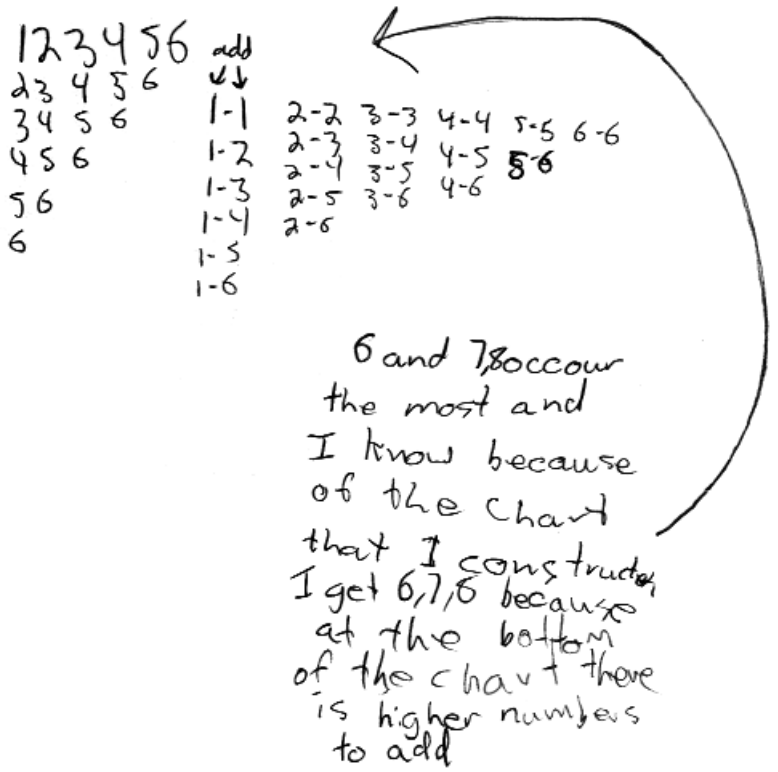
b) Calculate the least you could pay and the most you could pay.

the most you could pay is 13.2 and the least you could pay is 2.2

ie: 0.02 × 110.00 = 2.2
0.12 × 110.00 = 13.2

B

2. What percentage discount is most likely to occur? How do you know?



C

3. What is the probability of getting a percentage discount greater than 10%? Show your work.

The probility of 10 or higher would be 4:21 and not getting 10 or higher is 17:21.

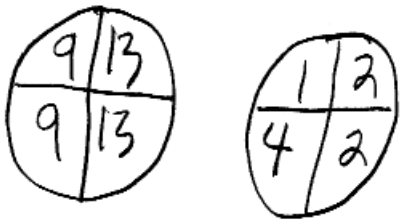
D

4. If you were offered a choice between a 10% discount and rolling the numbered cubes, which would you choose? Justify your choice.

I would chose 10% percent because the odds are against you 17:21 of the time you wolud get 1-9 and you would get 10-12 4:21 of the time so it's easier to chose 10%.

E

5. As the store manager, you are prepared to offer a discount of 15%. Invent another game that will produce this result. Determine the probability of a customer getting a 15% discount.



you would get 15% off 25% of the time

9-1 9-1 13-1 13-1
9-2 9-2 13-2 13-2 13-2 13-2
9-3 9-2 13-4
9-4 9-4 13-4

10 10 14 14 4:16
11 11 15 15 15 15
11 11
13 13 18 18

F

6. What discount is most likely to occur? How do you know?

15% because it coould happen 1/4 of the time

Teacher's Notes

Problem Solving

– The student selects and applies a problem-solving strategy to solve a multi-step problem involving percent and probability, arriving at an incomplete or inaccurate solution (e.g., in question 2, starts systematic lists, but fails to identify all possible outcomes).

Understanding of Concepts

– The student demonstrates a limited understanding of percent, fractions, and probability (e.g., in question 2, does not realize that there would be 36 possible outcomes for rolling the dice, rather than the 21 recorded).

Application of Mathematical Procedures

– The student applies a percent algorithm with many errors and/or omissions to solve problems involving discounts (e.g., in question 1b, states and calculates the discounts, but makes no attempt to calculate the final discounted costs; in question 5, makes a computation error [13 + 4 = 18 rather than 17]).
– The student applies mathematical procedures with many errors and/or omissions when investigating situations involving probability (e.g., in question 2, uses an incomplete list of combinations to determine an inaccurate probability; in question 6, fails to recognize the equal likelihood of discounts of 11% and 15% from question 5).

Communication of Required Knowledge

– The student uses mathematical language and notation to describe percent and fractions with limited clarity (e.g., in question 4, gives reasons why 10% would be better: "I would chose 10% because the odds are against you 17:21 of the time you wolud get 1-9 and you would get 10-12 4:21 of the time so it's easier to chose 10%").
– The student uses mathematical language and notation to explain situations involving probability with limited clarity (e.g., in question 5, gives no explanations of how to play the games and includes diagrams that fail to add any other information about how to play).

Comments/Next Steps

– The student should create an organizational system that will help him or her find all the possible outcomes when completing problem-solving activities.
– The student needs to ensure that all steps are included in multi-step problems to arrive at more thorough and accurate answers.
– The student should provide more detail in written explanations, including specific instructions and rules for invented games.
– The student needs to check all calculations, such as working backwards to check for accuracy.
– The student should use the appropriate dollar notation (e.g., in question 1b).

Rolling in Sales Level 1, Sample 2

A

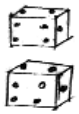
Rolling In Sales

A local clothing store decides to offer a unique sales promotion based on the sum of two standard numbered cubes.

The cubes are rolled and the numbers shown on each cube are added together. The sum of the numbers is your percentage discount.

The current price of one outfit is $110.00

1. **a) Explain how you would determine the lowest percentage discount and the highest percentage discount.** you can determine the lowest percentage discount by +'



+	1	2	3	4	5	6
1	2	3	4	5	6	7
2	3	4	5	6	7	8
3	4	5	6	7	8	9
4	5	6	7	8	9	10
5	6	7	8	9	10	11
6	7	8	9	10	11	12

b) Calculate the least you could pay and the most you could pay.

the least you could pay is = $\frac{2}{10}$ = 0.2 = 2%
or $2.20 off
the most you could pay is = 0.12 = 12%
or $13.20 off

B

2. What percentage discount is most likely to occur? How do you know?

+	1	2	3	4	5	6
1	2	3	4	5	6	7
2	3	4	5	6	7	8
3	4	5	6	7	8	9
4	5	6	7	8	9	10
5	6	7	8	9	10	11
6	7	8	9	10	11	12

- the percentage discount that is most likely to occur is: $\frac{6}{12}$ = 0.6 = 60%,

∴ 60% is most likely to occur

- this is because there is a more higher percent of 60 than any other.

C

3. What is the probability of getting a percentage discount greater than 10%? Show your work.

$P = \frac{3}{12} = 0.25 = 25\%$

∴ the probability of getting a percent discount greater than 10% is 25%.

see chart below

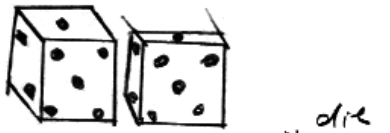
+	1	2	3	4	5	6
1	2	3	4	5	6	7
2	3	4	5	6	7	8
3	4	5	6	7	8	9
4	5	6	7	8	9	10
5	6	7	8	9	10	11
6	7	8	9	10	11	12

$\frac{3}{12} = 0.25 = 25\%$

D

4. If you were offered a choice between a 10% discount and rolling the numbered cubes, which would you choose? Justify your choice.

I would choice the rolling of the numbered cubes because on the cubes you can get higher than a 10% discount.



die

Outcomes

1 and 1
1 and 2
1 and 3
1 and 4
1 and 5
1 and 6

2 and 1
2 and 2
2 and 3
2 and 4
2 and 5
2 and 6

3 and 1
3 and 2
3 and 3
3 and 4
3 and 5
3 and 6

4 and 1
4 and 2
4 and 3
4 and 4
4 and 5
4 and 6

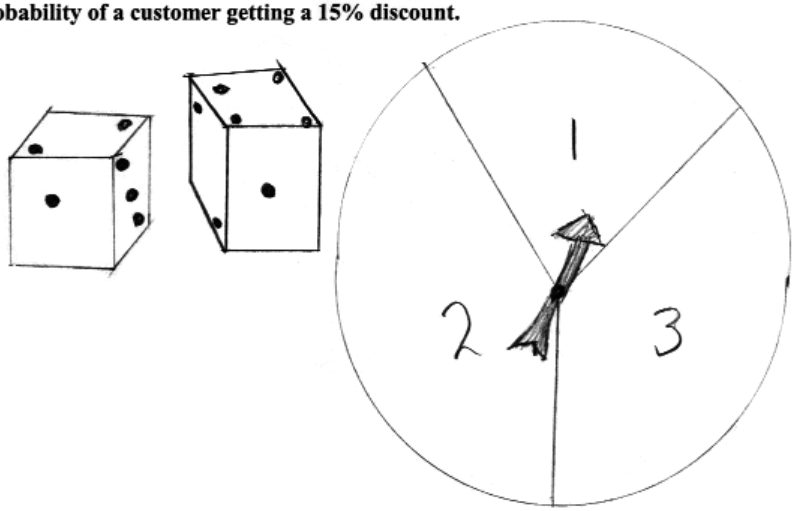
5 and 1
5 and 2
5 and 3
5 and 4
5 and 5
5 and 6

6 and 1
6 and 2
6 and 3
6 and 4
6 and 5
6 and 6

36 possible outcomes.

E

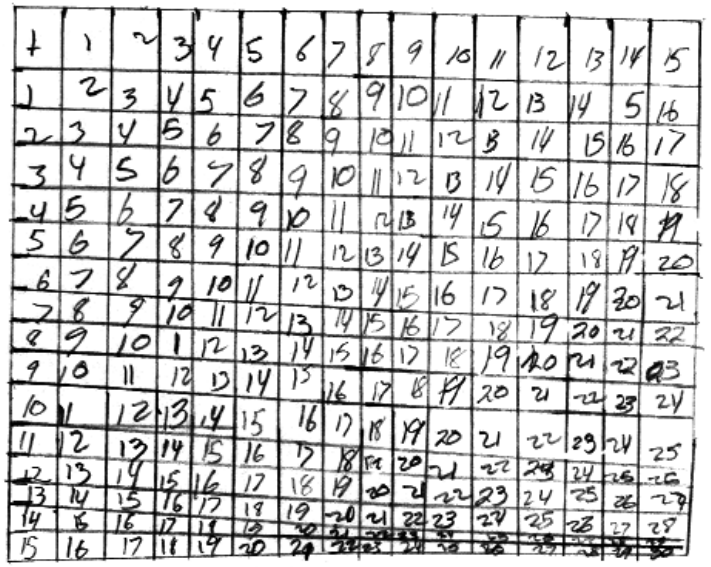
5. As the store manager, you are prepared to offer a discount of 15%. Invent another game that will produce this result. Determine the probability of a customer getting a 15% discount.



The most discount is 6 + 6 + 3 = 15
(dice, dice, spinner)

F

6. What discount is most likely to occur? How do you know?



∴ 15% is most likely to occur because it has the most

$= \frac{16}{30} = 0.5\overline{3} = 53\%$

Teacher's Notes

Problem Solving

- The student selects and applies a problem-solving strategy to solve a multi-step problem involving percent and probability, arriving at an incomplete or inaccurate solution (e.g., in question 2, uses a chart to identify possible outcomes, but includes both of the headers of the matrix in the calculations; in question 4, provides a tree diagram, which is incorrect in representing this problem).

Understanding of Concepts

- The student demonstrates a limited understanding of percent, fractions, and probability (e.g., in questions 1b and 2, shows inaccuracies in the use of the fractions and decimals, as in $^2/_{12} = 0.2 = 2\%$).

Application of Mathematical Procedures

- The student applies a percent algorithm with many errors and/or omissions to solve problems involving discounts (e.g., in question 1b, is able to determine the percentage discounts but not to apply an appropriate computation to calculate the discounted amounts).
- The student applies mathematical procedures with many errors and/or omissions when investigating situations involving probability (e.g., in question 2, lists all possible outcomes, but does not identify 7 as the most likely to occur; in question 6, constructs an inaccurate chart based on question 5; in question 3, selects 12 instead of 36 for the denominator in the probability calculations; in question 5, is unable to apply probability concepts to this scenario).

Communication of Required Knowledge

- The student uses mathematical language and notation to describe percent and fractions with limited clarity (e.g., in question 1b, in the calculation $^2/_{12} = 0.2 = 2\%$, none of the indicated notations are equivalent).
- The student uses mathematical language and notation to explain situations involving probability with limited clarity (e.g., in question 5, gives no explanation of how to play the game and includes diagrams that fail to add any other information about how to win a 15% discount).

Comments/Next Steps

- The student needs to correctly construct and interpret tables and charts for recording data.
- The student should utilize one organizing method effectively before starting to use alternative methods.
- To arrive at more thorough and accurate answers, the student needs to ensure that all steps are included in multi-step problems.
- The student should provide more detail in his or her written explanations, including specific instructions and rules for invented games.
- The student needs to check all calculations in some way, such as working backwards to check for accuracy.