Assessment : End-of-Unit Assessment

Problem 1

Students determine whether a number is prime or composite. The number 27 has 1, 3, 9, and 27 as factors and $3 \times 9 = 27$ should be a known fact from the previous grade. Since the only factors of 29 are 1 and 29, it is a prime number. Students can answer one or both problems incorrectly, but still understand the meaning of prime and composite, if they do not know their multiplication facts well.

Statement

1. Is 27 a prime number or a composite number? Explain or show your reasoning.
2. Is 29 a prime number or a composite number? Explain or show your reasoning.

Solution

1. Composite. Sample response: 27 is a composite number because it has factor pairs 1 and 27 and also 3 and 9.
2. Prime. Sample response: 29 is a prime number because it only has one factor pair, 1 and 29.

Aligned Standards

4.OA.B.4

Problem 2

This item assesses student understanding of the words factor and multiple. They may select B, and not select A, C, and E, if they confuse the meaning of factor and multiple. They may select D if they understand the meaning of factor but are not careful and forget the factor 7. Students may understand the meaning of factor but fail to select C if they do not see that $80 = 20 \times 4$.

Statement

Select **all** true statements.

A. 15 is a multiple of 3.

B. 16 is a factor of 8.

C. 80 is a multiple of 4.

D. The only factor pair of 49 is 1 and 49.

E. The factor pairs of 12 are 1 and 12, 2 and 6, and 3 and 4.

Solution

["A", "C", "E"]

Aligned Standards

4.OA.B.4

Problem 3

Students find all factor pairs of a number within 100. The calculations on this item are more challenging than the previous items. If students omit one or more of the factor pairs, or choose incorrect factor pairs, they may need more practice with multiplication within 100.

Statement

Find **all** factor pairs of 84.

Solution

1 and 84, 2 and 42, 3 and 28, 4 and 21, 6 and 14, 7 and 12.

Aligned Standards

4.OA.B.4

Problem 4

Students examine multiples of different numbers. The first two questions give them some experience making the calculations they will need to solve the third problem but are not needed in order to work on the final problem. Students may realize that the product $3 \times 4 \times 5$ is a multiple of 3, 4, and 5 but more likely they will use a trial and error approach. This approach will work well unless they try, for example, all multiples of 3 in which case there are a lot of possibilities before reaching 60, the smallest possible answer and the only answer within the range from 0 to 100.

It is not essential that students completely solve the final problem. It is important that they demonstrate understanding of the relationship between the given number of players and the possible number of cards.

Statement

Han is playing a card game with friends. The number of cards never changes, but the number of players does.

1. With 5 players, the cards can be divided equally between the players. Could there be 50 cards? Explain or show your reasoning.
2. With 3 players, the cards can be divided equally between the players. Could there be 50 cards? Explain or show your reasoning.
3. With 4 players, the cards can be divided equally between the players. How many cards could there be? Explain or show your reasoning.

Solution

1. Yes. 50 is a multiple of 5. Each player could get 10 cards.
2. No, 50 is not a multiple of 3 so you cannot divide 50 cards into 3 equal groups.
3. 60. I need a number that is a multiple of 3 (since the cards can be divided evenly between 3 players) and

is also a multiple of 4 and 5. I know 20 is a multiple of 4 and 5, but it is not a multiple of 3. I tried 40, which is a multiple of 4 and 5, but it is not a multiple of 3. The number 60 is a multiple of 4, 5, and 3.

Aligned Standards

4.OA.B.4