

• Analysis •**1. Correct Answer: 34**

- ⊕ The student needed to know that the absolute value of a number is the distance of a number from zero on the number line. The student may also refer to absolute value as the magnitude (value) of a number without regard to its sign.

SKILL: Determine the absolute value of a number.

2. Correct Answer: 20

- ⊕ The student needed to explain how to subtract integers. The student could demonstrate his understanding in one of the following ways:

1. He could explain that subtracting integers is as the same as adding the opposite.

Example: $7 - (-13)$ is the same as $7 + 13$.

2. He could show how to subtract integers on a number line.

3. He used models or drew a picture to represent positive and negative number to demonstrate how to subtract integers.

SKILL: Subtract integers.

3. Correct Answer: 12

- ⊕ The student needed to know how to divide integers. He needed to show and explain that a negative integer divided by a negative integer equals a positive integer.

SKILL: Divide integers.

4. Correct Answer: $x = 85$

- ⊕ The student needed to know how to solve for an unknown in a proportion.

- ⊕ The student could have solved the problem in one of several ways:

⊕ **Solution A:**

1. Determine the ratio between the two known numerators.

$$\cancel{3} \cdot \frac{5}{\cancel{3}_1} = 5 \quad \cancel{17} \cancel{51} \cdot \frac{5}{\cancel{3}_1} = 85$$

$$\frac{3}{51} = \frac{5}{85}$$

2. Multiply the numerator and denominator of the known fraction by that ratio.

⊕ **Solution B:**

1. Determine the ratio between the numerator and denominator of the given fraction.

$$\frac{3}{51} = \frac{1}{17}$$

$$3 \cdot \frac{17}{1} = 51 \quad 5 \cdot \frac{17}{1} = 85$$

$$\frac{3}{51} = \frac{5}{85}$$

2. Multiply both numerators by the reciprocal of that ratio.

➤ **Solution C:**

1. Cross multiply the numerators and denominators to create an equation.

2. Solve for the unknown.

$$\begin{array}{l} \frac{3}{51} = \frac{5}{x} \\ 3x = 51 \cdot 5 \\ \frac{3x}{3} = \frac{255}{3} \\ x = 85 \end{array} \quad \text{or} \quad \begin{array}{l} \frac{3}{51} = \frac{5}{x} \\ 3x = 51 \cdot 5 \\ 3x = 255 \\ \frac{1}{3} \cdot 3x = \frac{1}{3} \cdot 255 \\ x = 85 \end{array}$$

SKILL: Solve for the unknown in a proportion.

5. Correct Answer: $1\frac{1}{5}$

➤ The student needed to subtract a mixed number from a whole number. He needed to regroup from the whole number and then subtract.

$$\begin{array}{r} \cancel{3}4 \frac{5}{5} \\ - 2 \frac{4}{5} \\ \hline 1 \frac{1}{5} \end{array}$$

SKILL: Subtract mixed numbers and simplify the answer to lowest terms.

6. Correct Answer: 8

➤ The student needed to know that exponents represent repeated multiplication. To simplify the exponent, he needed to multiply the base by itself the number of times indicated by the exponent.

$$2^3 = 2 \cdot 2 \cdot 2 = 8$$

SKILL: Simplify an expression with a positive exponent.

7. Correct Answer: -9

➤ The student needed to know that exponents represent repeated multiplication. He also needed to know the order of operations, which indicate that exponents are addressed first. Therefore, since there were no parentheses to show that the minus sign belonged to the 3, he needed to multiply first and then take the opposite.

$$\begin{array}{l} -3^2 \\ -(3 \cdot 3) = \\ -(9) = \\ -9 \end{array}$$

SKILL: Simplify an exponent with a negative sign.

8. Correct Answer: $y = -4$

➤ The student needed to solve for the unknown y . He could have done this in one of two ways:

➤ **Solution A:**

1. Subtract five from both sides.
2. Multiply both sides by the reciprocal of the coefficient.

$$7y + 5 = -23$$

$$7y + 5 - 5 = -23 - 5$$

$$7y = -28$$

$$\frac{1}{7} \cdot 7y = -28 \cdot \frac{1}{7}$$

$$y = -4$$

➤ **Solution B:**

1. Subtract five from both sides.
2. Divide both sides by the coefficient.

$$7y + 5 = -23$$

$$7y + 5 - 5 = -23 - 5$$

$$7y = -28$$

$$\frac{7}{7}y = \frac{-28}{7}$$

$$y = -4$$

SKILL: Solve a two-step equation with one unknown.

9. Correct Answer: 4

1. The student needed to find the square root of 16, or the number which, when multiplied by itself, yields a product of 16.

$$\sqrt{16} = \sqrt{4 \cdot 4} = 4$$

SKILL: Determine the square root.

10. Correct Answer: -126

➤ The student needed to multiply the integers. A negative integer multiplied by a positive integer yields a negative product.

$$\begin{array}{r} -14 \\ \times 9 \\ \hline \end{array}$$

$$\begin{array}{r} -14 \\ \times 9 \\ \hline \end{array}$$

$$\begin{array}{r} -14 \\ \times 9 \\ \hline \end{array}$$

SKILL: Multiply integers.

11. A student who has mastered the prerequisite concepts should be able to complete the written assessment in about 30 minutes.

12. A student who has mastered the prerequisite concepts should feel confident in his or her ability to solve the problems and should not need to ask for assistance.