You Try:

Substitute to evaluate the following algebraic expressions when $x = 2$, $y = 25$ and $z = 8$. Show all of your work!

1) $3z$	2) $y - z + x$	3) y^x
4) $z \div x$	5) $x + y + z$	6) $9 - x$
7) $100 - 10x - 10z$	8) $14 \div x + 2y$	9) w^0
10) xyz	11) $z(x + y)$	12) $x + x \bullet y$

Evaluating Expressions Extra Practice

Use substitution to evaluate each expression for the given value of the variable. Show your work!

1) $9y - 3$ (for y = 11)	2) $7m$ (for m = 5)	3) $d^2 - 2d$ (for d = 9)
4) $6q + 39$ (for q=10)	5) $6v$ (for v = 3)	6) $j^3 + 11$ (for j = 8)
7) $2k^2 + 5k + 2$ (for k = 11)	8) $\frac{n}{3} + n$ (for n = 27)	9) $a \div 3$ (for a = 42)
10) $4(11 + p) + 13$ (for p = 89)	11) $h^3 - 2$ (for h = 7)	12) $14z - 1$ (for z = 9)

Evaluating Expressions Extra Practice

Use substitution to evaluate each expression for the given value of the variable. Show your work!

13) $15e + 37$ (for e = 5)	14) $19r$ (for r = 8)	15) $x^2 + 2x + 4 + x$ (for x = 10)
16) $7(4 + h)$ (for h=21)	17) $13 + w$ (for w = 26)	18) $b - 15$ (for b = 15)
19) $\frac{y}{12} + y$ (for y = 72)	20) $3b^2 + 5b$ (for b = 2)	21) $8e + 22$ (for e = 42)
22) $2x^2 - 11x + 6$ (for x = 12)	23) $p^3 - 4p$ (for p = 4)	24) $16(3 + a) - a$ (for a = 13)

Using and Evaluating Formulas

A formula is a mathematical rule written using variables, usually an expression or equation describing a relationship between quantities.

To ***evaluate*** or ***solve*** a formula, you substitute the number for the variable.

Common Formulas

Area of a rectangle = l • w

Area of a triangle = $\frac{1}{2}bh$

Area of a Trapezoid = $h(\frac{b_1+b_2}{2})$

Surface Area of a Cube = $6s^2$

Volume of a Cube = s^3

Example 1: Mary Lou is setting up a lemonade stand. Her rectangular sign is 3 feet long and 2.5 feet wide. If the formula for area of a rectangle is A = l • w, what is the area of her sign?

A = l • w → *Step 1: Write the formula.*
A = 3 ft • 2.5 ft → *Step 2: Substitute for the variable(s).*
A = 7.5 ft² → *Step 3: Solve (in this case, multiply).*

Example 2: Billy Bob needs to figure out the volume of a cube. It is 12 in tall. Help him find the volume, if the formula is $V = s^3$.

$V = s^3$ → *Step 1: Write the formula.*
V = 12 in • 12 in • 12 in → *Step 2: Substitute for the variable(s).*
V = 144 • 12 → *Step 3: Solve (in this case, multiply).*
$V = 1728\ in^3$

You Try:

1) What is the surface area of a cube that is 4 in. tall?
2) What is the area of a rectangle with a height of 8.5 cm and a width of 3 cm?
3) What is the area of a triangle with a height of 5m and a base length of 9m?
4) What is the area of a trapezoid that is 4cm high, with bases that are 10cm and 12cm long?
5) Why are formulas useful/helpful?