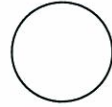


Jig-Saw Problem - Circles



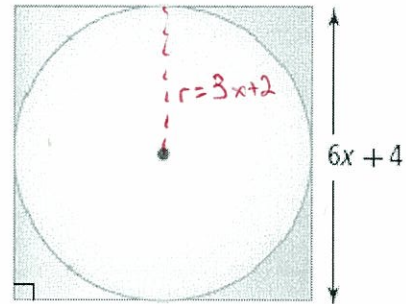
Jig Saw Instructions:

1. In a group of 4, each member will solve the problem on their page individually.
2. Join 3 or 4 other people with the same shape and work together to become "experts" on the provided problem.
3. Rejoin your original group and each person will have a turn explaining the solution to the problem that they are now an "expert" on.

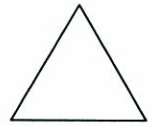
Problem

A circle is inset into a square with a side length of $6x + 4$, as shown. Write an expression to represent the area of the circle. Multiply, and then combine like terms.

$$\begin{aligned} A &= \pi r^2 \\ &= \pi (3x+2)^2 \\ &= \pi (3x+2)(3x+2) \\ &= \pi (9x^2 + 12x + 4) \\ &= 9\pi x^2 + 12\pi x + 4\pi \end{aligned}$$



Jig-Saw Problem - Triangles



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Problem

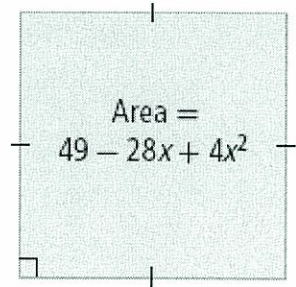
The area of a square can be given by $49 - 28x + 4x^2$, where x represents a positive integer. Write a possible expression for the perimeter of the square.

$$A = 4x^2 - 28x + 49$$

$$A = (2x-7)(2x-7)$$

$$\begin{array}{r|rr} & 2x & -7 \\ \hline 2x & 4x^2 & -14x \\ -7 & -14x & 49 \end{array} \quad \begin{array}{l} \underline{-14x} + \underline{-14x} = -28x \\ \underline{-14x} - \underline{-14x} = 196x^2 \end{array}$$

$$\begin{array}{r|rr} & 40 & 9 \\ \hline 4 & 160 & 36 \end{array}$$



Perfect Square Trinomial
 \therefore it must be $-14x$ and $-14x$.

$$\begin{array}{r|rr} & 10 & 4 \\ \hline 10 & 100 & 40 \\ 4 & 40 & 16 \end{array} = 196$$

$$P = 4s$$

$$P = 4(2x-7)$$

$$P = 8x - 28$$

Jig-Saw Problem - Squares



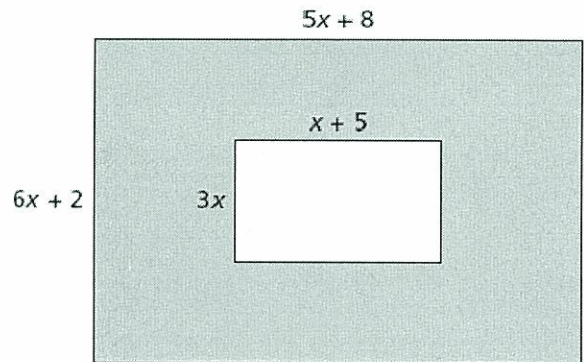
Jig Saw Instructions:

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Problem

Write a polynomial to represent the area of the shaded region in the rectangle shown. Simplify the polynomial.

$$\begin{aligned} A &= (6x+2)(5x+8) - (3x)(x+5) \\ &= (30x^2 + 58x + 16) - (3x^2 + 15x) \\ &= 30x^2 + 58x + 16 - 3x^2 - 15x \\ &= \boxed{27x^2 + 43x + 16} \end{aligned}$$



Jig-Saw Problem - Stars



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Problem

A rectangular prism has a volume of $6x^4 + 17x^3 + 5x^2$. Write algebraic expressions for the dimensions of the rectangular prism.

$$V = 6x^4 + 17x^3 + 5x^2$$

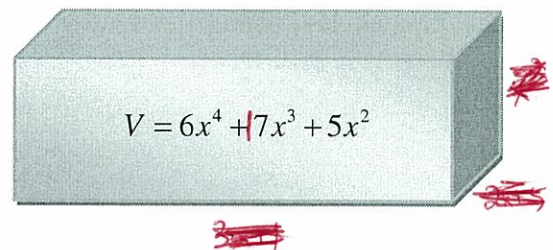
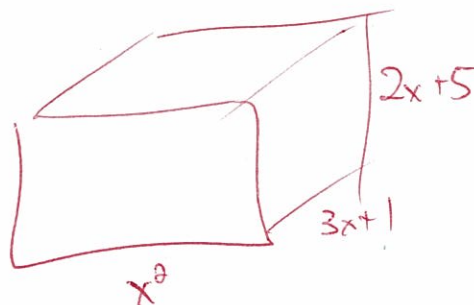
$$V = x^2(6x^2 + 17x + 5)$$

$$V = x^2(3x+1)(2x+5)$$

$$l = x^2$$

$$w = 3x+1$$

$$h = 2x+5$$



$$\begin{array}{r|l}
 2x + 5 & \\
 \hline
 3x & 6x^2 \quad 15x \quad \text{---} + \text{---} = 17x \\
 +1 & 5 \quad \text{---} \text{---} = 30x^2
 \end{array}$$