# 11.5 HW Solutions

Find the sum or difference.

1. $(x^3 + 2x - 10) + (x^3 - x^2 + 4)$ $2x^3 - x^2 + 2x - 6$
2. $(2x - 3y - 1) + (4x - y + 9)$ $6x - 4y + 8$
3. $(2a + 4b - 4c) - (5a + 2b - c)$ $3a + 2b - 3c$
4. $(2xy - 3y^2 - 3x) - (5y^2 + 2x - 4xy)$ $6xy - 8y^2 - 5x$
5. $(x^2 - 10) + (x^2 - 3x + 7) - (3x^2 + x - 8)$ $-x^2 - 4x + 5$
6. $(2a^2 - 5ab - b^2) - (4a^2 + ab + 5b^2) - (ab + a^2)$

$2a^2 - 5ab - b^2 - 4a^2 - ab - 5b^2 - ab - a^2$

$\boxed{-3a^2 - 7ab - 6b^2}$

Find the product.

7. $5(p^2 - 4p - 2)$ $5p^2 - 20p - 10$
8. $3y(2y^2 - y + 1)$ $6y^3 - 3y^2 + 3y$
9. $(2t + 6)(3t + 5)$ $6t^2 + 28t + 30$
10. $(6 - 2w)(w + 7)$ $6w + 42 - 2w^2 - 14w \rightarrow \boxed{-2w^2 - 8w + 42}$
11. $(2x + 3y)(2x - y)$ $4x^2 - 2xy + 6xy - 3y^2 \rightarrow \boxed{4x^2 + 4xy - 3y^2}$
12. $(2m^2 - 5n)(m^2 - 3n)$ $2m^4 - 11m^2n + 15n^2$
13. $2(3h - 2)(4h + 7)$ $2(12h^2 + 13h - 14) \rightarrow \boxed{24h^2 + 26h - 28}$
14. $4(a + 4b)(a - 3b)$ $4(a^2 - 3ab + 4ab - 12b^2) \rightarrow \boxed{4a^2 + 4ab - 48b^2}$

15. Write two polynomials whose sum is $3x^3 + 2x^2 - 5x + 3$.   } you tell me!
16. Write two polynomials whose difference is $-5y^2 - 7y - 2$.   } ☺

6x + 1
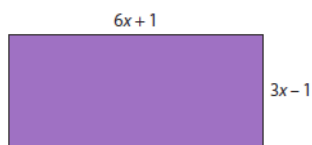
17 a. Write an expression to represent the perimeter of the rectangle to the left. $2(6x+1) + 2(3x-1) \rightarrow 12x + 2 + 6x - 2 \rightarrow \boxed{18x}$

3x – 1

b. Write an expression to represent the area of the rectangle.

$A = b \cdot h$

$A = (6x+1)(3x-1)$

$\boxed{A = 18x^2 - 3x - 1}$

18. The area model shown in the figure below can be used to show the product of $(2x + 1)$ and $(x + 3)$.
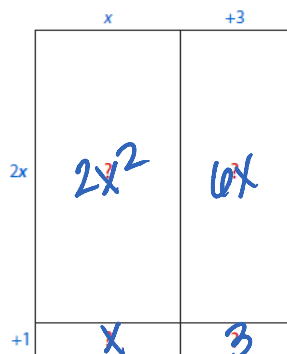
	x	+3
2x	$2x^2$	$6x$
+1	x	3

a. Complete the model by replacing each question mark with the

a. Complete the model by replacing each question mark with the area of the indicated rectangle.

b. Use your model from Part (a) to find a polynomial expression for $(2x + 1)(x + 3)$. $2x^2 + 7x + 3$

c. Verify your results algebraically.

$(2x+1)(x+3)$
$2x^2 + 6x + x + 3$
$\boxed{2x^2 + 7x + 3}$

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19. You can also use an area model to help you find the square of a binomial. Draw an area model for each expression. Find the total sum of the areas of the rectangles and write your sum as a trinomial.

a)
	x	5
x	x^2	5x
5	5x	25
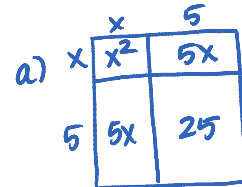
a. $(x + 5)^2 = x^2 + 10x + 25$

b. $(y + 8)^2 = y^2 + 16y + 64$

c. Look carefully at your answers to Parts (a) and (b). Use your observations to fill in the blanks in the following:

$(a + b)^2 = \underline{a^2 + 2ab + b^2}$ } Square Double Square

The square of $a + b$ is the square of $\underline{a}$ plus twice the product of $\underline{a \cdot b}$ plus the square of $\underline{b}$.
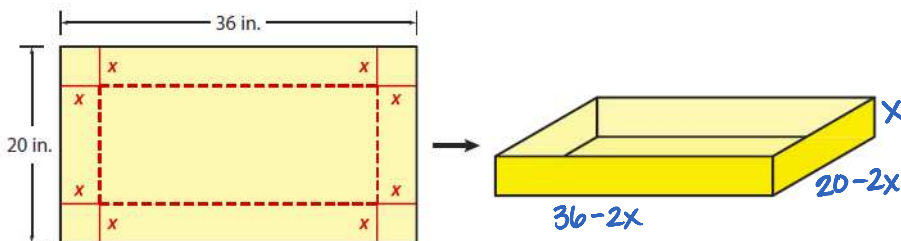
d. Find $(x - 7)^2$. Use an area model if needed. $x^2 - 14x + 49$

e. What number would you add to the expression below to make it a perfect square trinomial? Use an area model if needed.

$x^2 + 12x + \boxed{36}$

$(x+6)(x+6)$

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20. If you cut the corners out of a rectangular piece of cardboard and then fold up the flaps, you can make a box.

36 in.
20 in.
x
$20 - 2x$
$36 - 2x$

a. Once the cardboard is folded, what are the length, width, and height of the box in terms of x? $(36 - 2x)$ in ; $(20 - 2x)$ in; x in.

b. What is the volume of the box? $V = l \cdot w \cdot h = x(36 - 2x)(20 - 2x)$ in^3 or $x(720 - 72x - 40x + 4x^2)$
$x(720 - 112x + 4x^2)$
$720x - 112x^2 + 4x^3$
so $\boxed{(4x^3 - 112x^2 + 720x) \text{ in}^3}$

c. Assuming that the box has no lid, what is the outside surface area of the box?

S.A. $= 2 \cdot x(20 - 2x) + 2 \cdot x(36 - 2x) + (36 - 2x)(20 - 2x)$
$= 40x - 4x^2 + 72x - 4x^2 + 720 - 112x + 4x^2$
$= (-4x^2 + 720) \text{ in}^2$

22. Multiply $(x + 1)(2x^2 + x + 4)$.

$2x^3 + x^2 + 4x + 2x^2 + x + 4$

$$2x^3 + 3x^2 + 5x + 4$$