

7.4 Subtracting Linear Expressions

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When subtracting linear expressions, subtract like terms.

Example: Subtract.

a.) $(5x + 4) - (3x + 2)$

$$\boxed{5x} + \boxed{4} + \boxed{-3x} \boxed{-2}$$

$$\boxed{2x + 2}$$

b.) $(4x + 5) - (2x + 3)$

$$\boxed{4x} + \boxed{5} + \boxed{-2x} \boxed{-3}$$

$$\boxed{2x + 2}$$

Example: Subtract.

c.) $(7x - 5) - (2x - 1)$

$$\boxed{7x} \boxed{-5} + \boxed{-2x} \boxed{+1}$$

$$\boxed{5x - 4}$$

d.) $(6x - 4) - (2x - 4)$

$$\boxed{6x} \boxed{-4} + \boxed{-2x} \boxed{+4}$$

$$4x + 0 = \boxed{4x}$$

e.) $(-3x - 5) - (-x - 1)$

$$\boxed{-3x} \boxed{-5} + \boxed{1x} \boxed{+1}$$

$$\boxed{-2x - 4}$$

f.) $(3x + 2) - (-2x + 1)$

$$\boxed{3x} + \boxed{2} + \boxed{2x} \boxed{-1}$$

$$\boxed{5x + 1}$$

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Example: Subtract.

g.) $(6m + 3) - (-4m - 1)$

$$\boxed{6m+3} + \boxed{4m+1}$$

$$\boxed{10m+4}$$

h.) $(-2x - 3) - (-4x + 2)$

$$\boxed{-2x-3} + \boxed{4x-2}$$

$$\boxed{2x-5}$$

You can solve real-world problems by subtracting linear expressions.

Example: The expression $9x + 27$ represents the total amount of money a band earned from selling x CD's.

a.) If the band had to pay $(3x + 12)$ dollars in expenses, what is an expression that represents their profit?

$$(9x+27) - (3x+12)$$

$$\boxed{9x+27} + \boxed{-3x-12}$$

$$\boxed{6x+15}$$

b.) If the band sold 125 CD's, what was their profit?

$$6x+15 = 6(125)+15 = 750+15 = \boxed{765}$$

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Example: After working x hours on Monday, Kay earns $9x$ dollars. On Tuesday, she earns $(7x + 3)$ dollars.

a.) Write an expression to represent how much more she earned on Monday.

$$9x - (7x + 3)$$

$$9x + (-7x) - 3$$

$$2x - 3$$

b.) If she worked for 5 hours each day, how much more did she earn on Monday?

$$2x - 3 = 2(5) - 3 = 10 - 3 = 7$$

Example: The expression $8x + 48.75$ represents the total amount of money the soccer team earned from selling x T-shirts.

a.) If the team had to pay $(2x + 24)$ dollars in expenses, write an expression to represent their profit.

$$(8x + 48.75) - (2x + 24)$$

$$8x + 48.75 + (-2x) - 24$$

$$6x + 24.75$$

b.) If the soccer team sold 54 T-shirts, what was their profit?

$$6x + 24.75 = 6(54) + 24.75 = 324 + 24.75$$

$$\begin{array}{r} 24 \\ \times 54 \\ \hline 324 \end{array}$$

$$= 348.75$$

$$\begin{array}{r} 48.75 \\ - 24.00 \\ \hline 24.75 \end{array}$$

$$\begin{array}{r} 324.00 \\ + 24.75 \\ \hline 348.75 \end{array}$$