

Use the Distributive Property to simplify each expression. You may need to use some exponent properties.

| | | | |
|------------------|---------------------|------------------------|----------------------|
| 1) $3(x+2)$ | 2) $3x(x+2)$ | 3) $3x^2(x+2)$ | 4) $3x^3(x+2)$ |
| 5) $5(x^2+3x-7)$ | 6) $5x^4(x^2+3x-7)$ | 7) $x^2(x^3+3x^5+x^7)$ | 8) $5x^2(2x^2+4x^3)$ |

Odd Answers (jumbled): $3x^3+6x^2$, $5x^2+15x-35$, $3x+6$, $x^5+3x^7+x^9$

| <p>Like Terms are terms that have the same exact variable part (including exponents) as each other.</p> <table border="1" style="width: 100%;"> <thead> <tr> <th style="text-align: center;"><i>Like Terms</i></th> <th style="text-align: center;"><i>Not Like Terms</i></th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">x and x</td> <td style="text-align: center;">x and y</td> </tr> <tr> <td style="text-align: center;">$2xy$ and $-8xy$</td> <td style="text-align: center;">$2xy$ and $-8x$</td> </tr> <tr> <td style="text-align: center;">$5a^2$ and $3a^2$</td> <td style="text-align: center;">$2x$ and $2x^2$</td> </tr> <tr> <td style="text-align: center;">$-3xy^2$ and $4xy^2$</td> <td style="text-align: center;">$-3xy^2$ and $4x^2y$</td> </tr> </tbody> </table> | <i>Like Terms</i> | <i>Not Like Terms</i> | x and x | x and y | $2xy$ and $-8xy$ | $2xy$ and $-8x$ | $5a^2$ and $3a^2$ | $2x$ and $2x^2$ | $-3xy^2$ and $4xy^2$ | $-3xy^2$ and $4x^2y$ | <p>Combine Like Terms by combining their coefficients and leaving the variable parts (including exponents) unchanged.</p> <table border="1" style="width: 100%;"> <thead> <tr> <th style="text-align: center;"><i>Simplify</i></th> <th style="text-align: center;"><i>Cannot be Simplified</i></th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">$x + x = 2x$</td> <td style="text-align: center;">$x + y$</td> </tr> <tr> <td style="text-align: center;">$2xy + (-8xy) = -6xy$</td> <td style="text-align: center;">$2xy + (-8x)$</td> </tr> <tr> <td style="text-align: center;">$5a^2 + 3a^2 = 8a^2$</td> <td style="text-align: center;">$2x + 2x^2$</td> </tr> <tr> <td style="text-align: center;">$-3xy^2 + 4xy^2 = 1xy^2$</td> <td style="text-align: center;">$-3xy^2 + 4x^2y$</td> </tr> </tbody> </table> | <i>Simplify</i> | <i>Cannot be Simplified</i> | $x + x = 2x$ | $x + y$ | $2xy + (-8xy) = -6xy$ | $2xy + (-8x)$ | $5a^2 + 3a^2 = 8a^2$ | $2x + 2x^2$ | $-3xy^2 + 4xy^2 = 1xy^2$ | $-3xy^2 + 4x^2y$ |
|---|-----------------------------|-----------------------|-------------|-------------|------------------|-----------------|-------------------|-----------------|----------------------|----------------------|--|-----------------|-----------------------------|--------------|---------|-----------------------|---------------|----------------------|-------------|--------------------------|------------------|
| <i>Like Terms</i> | <i>Not Like Terms</i> | | | | | | | | | | | | | | | | | | | | |
| x and x | x and y | | | | | | | | | | | | | | | | | | | | |
| $2xy$ and $-8xy$ | $2xy$ and $-8x$ | | | | | | | | | | | | | | | | | | | | |
| $5a^2$ and $3a^2$ | $2x$ and $2x^2$ | | | | | | | | | | | | | | | | | | | | |
| $-3xy^2$ and $4xy^2$ | $-3xy^2$ and $4x^2y$ | | | | | | | | | | | | | | | | | | | | |
| <i>Simplify</i> | <i>Cannot be Simplified</i> | | | | | | | | | | | | | | | | | | | | |
| $x + x = 2x$ | $x + y$ | | | | | | | | | | | | | | | | | | | | |
| $2xy + (-8xy) = -6xy$ | $2xy + (-8x)$ | | | | | | | | | | | | | | | | | | | | |
| $5a^2 + 3a^2 = 8a^2$ | $2x + 2x^2$ | | | | | | | | | | | | | | | | | | | | |
| $-3xy^2 + 4xy^2 = 1xy^2$ | $-3xy^2 + 4x^2y$ | | | | | | | | | | | | | | | | | | | | |

Simplify by combining like terms. Check for your answer below after trying the problem.

| | | | |
|----------------|---------------|--------------------|---------------------------|
| 9) $3x^2+5x^2$ | 10) $9xy-4xy$ | 11) $x+x+x^2+3x^2$ | 12) $3x^2-2x^2+4x-8x+5+8$ |
|----------------|---------------|--------------------|---------------------------|

Possible Answers: $2x+4x^2$, $5xy$, $8x^2$, $4x^2-3x$, $x^2-4x+13$, $x^2+12x+3$

Distribute and Combine Like Terms: Check for your answer below.

| | | |
|---------------------------------|----------------------------|-----------------------------|
| 13) $3x(x^2-4x)+5(x^3-2x^2)$ | 14) $5(2x^2-3x+4)+x(2x-5)$ | 15) $3xy(2x+8)-2y(4x-7x^2)$ |
| 16) $5x^2(x^3-4x^2)+x(x^4+x^3)$ | 17) $5x^2-3x(x-7)+4x$ | 18) $4x^2(3x-5)+2x(5x+10)$ |

Possible Answers: $12x^2-20x+20$, $2x^2+25x$, $20x^2y+16xy$, $14x^2y+15x$, $8x^3-22x^2$, $12x^3-10x^2+20x$, $6x^5-19x^4$

Match each expression on the left with its like term on the right and then find the SUM of the two terms.

| | | |
|---|--|--|
| <p>19)</p> $\begin{array}{rcl} x^2 & -9y^2 & = \\ 4xy & 4xy^2 & = \\ 12x^3 & 5x^2 & = \mathbf{6x^2} \\ -8xy^2 & x^3 & = \\ 6y^2 & -8xy & = \end{array}$ | <p>20)</p> $\begin{array}{rcl} x^4 & x^2 & = \\ 4x^2 & 8xy & = \\ -7xy & 7x^2y & = \\ -8x^2y & x^4 & = \\ 8y^8 & 8y^8 & = \end{array}$ | <p>21)</p> $\begin{array}{rcl} ab^2 & -9a^9 & = \\ a^2 & ab^2 & = \\ a^2b & 5a & = \\ 5a & a^2 & = \\ 9a^9 & a^2b & = \end{array}$ |
|---|--|--|

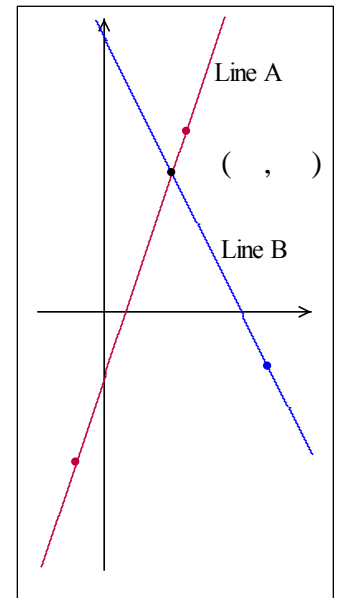
Linear Function Problem Solving:

22) Use the information about the lines to solve the problem. You must show all work algebraically.

Line A passes through (6, 13) and (-2, -11).

Line B passes through (12, -4) and has a slope = -2

Find the **equation of each line** and then **find the point of intersection** of the lines. **Organize your work.** You may want to use separate paper.



23) Simplify the following expressions. Answers should not have negative exponents.

| | | | | |
|---|----------------------|--------------------------------|--------------------|------------------------------|
| a) 8^{-1} | d) x^3x^8 | g) $\frac{3x^{-8}}{y^0z^{-1}}$ | h) $(3x^8)(10x^6)$ | i) $\frac{20x^2y^3}{50xy^7}$ |
| b) 5^{-2} | e) $(x^3)^8$ | | | |
| c) 12^0 | f) $\frac{x^3}{x^8}$ | | | |
| j) $\frac{24x^2y^4}{6x^4y^3 \cdot 5x^3y^2}$ | | k) $(3x^2y^5)^4$ | | l) $(4x^2y^3)^2(x^5y^2)^3$ |