

NAME: \_\_\_\_\_ **SOLUTION** \_\_\_\_\_

There are 22 questions. Some are multiple choice and some are free response.  
 Each question is worth 5 points over 100 (so 10 points are extra credit).  
 For multiple-choice questions, just circle your answer.  
 For free-response questions, **SHOW ALL WORK** to receive credit.

1. Add:  $(7x^3 - 4x^2 + 4x - 2) + (5x^3 - 7x^2 + x - 6)$

Solution:  $12x^3 - 11x^2 + 5x - 8$

2. Subtract:  $(3t^7 + 6t^5 - t^3 - 1) - (5t^7 - 3t^5 + 2t^3 + 3)$

Solution:  $-2t^7 + 9t^5 - 3t^3 - 4$

3. What is the solution to the following system of equations?

$$\begin{cases} -2x + 4y = -21 \\ -8x + 16y = -72 \end{cases}$$

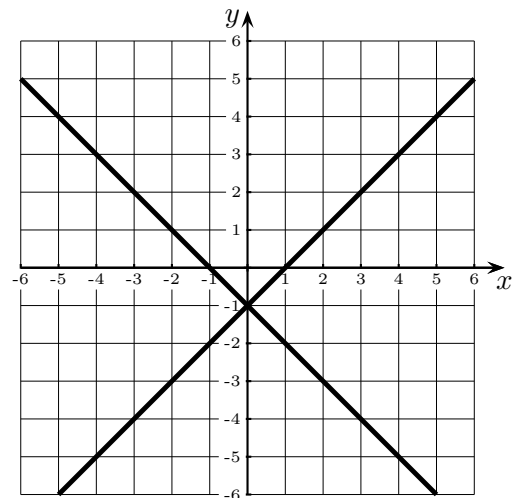
**Circle the answer.**

**Solution:**

- (a) No solution
- (b) (3, 0)
- (c) (7, -4)
- (d) Infinitely many solutions

4. The graphs of two linear equations in a system is shown below.

Find the solution of the system of equations. If there is no solution or there are infinitely many solutions, write it.



Solution:  $(0, -1)$

5. Subtract:  $(6x^2 + 4x - 4) - (-7x^2 - 4x - 5)$

**Solution:**  $13x^2 + 8x + 1$ .

6. Find the  $x$  and  $y$  intercepts of the graph of the equation  $y = x + 6$ .

**Solution:**

The  $x$  intercept is:  $-6$

The  $y$  intercept is:  $6$

7. Given the function  $f(x) = 3x^2 + 5x - 2$ , calculate the following values:

**Solution:**

•  $f(0) = -2$

•  $f(2) = 20$

•  $f(-2) = 0$

•  $f(x + 1) = 3(x + 1)^2 + 5(x + 1) - 2$

•  $f(-x) = 3x^2 - 5x - 2$

8. Solve the following system of equations.

$$\begin{cases} -3x + 2y = -10 \\ -5x + 3y = -17 \end{cases}$$

**Solution:**  $(4, 1)$ .

9. For the polynomial  $x^2 + x^5 - 3x - 5$ ,  
a) Determine the coefficient and the degree of each term.

**Solution:**

Term	Coefficient	Degree
$x^2$	1	2
$x^5$	1	5
$-3x$	-3	1
$-5$	-5	0

b)

The degree of the polynomial is  $\boxed{5}$ ,

The leading term is  $\boxed{x^5}$ ,

The leading coefficient is  $\boxed{1}$ .

11. Simplify the expression  $(3x^6y^3)(7x^{15}y^{11})$

**Solution:**

$$\boxed{21x^{21}y^{14}}$$

10. Simplify the expression  $\frac{30x^{14}y^{17}z^{17}}{6x^9y^{12}z^{14}}$

**Solution:**

$$\boxed{5x^5y^5z^3}$$

12. Simplify the expression  $\left(\frac{10x^4y^3}{5x^6y^{-3}}\right)^4$

**Solution:**

$$\boxed{16x^{-8}y^{24}} \quad \text{or} \quad \boxed{\frac{16y^{24}}{x^8}}$$

13. Write in scientific notation:

63400000

**Solution:**

$$\boxed{6.34 \times 10^7}$$

14. Write in decimal notation

**Solution:**

$$5.4 \times 10^{-4} = \boxed{0.00054}$$

15. Divide and write in scientific notation:

$$\frac{1.2 \times 10^3}{4.8 \times 10^7}$$

**Circle the answer**

**Solution:**

(a)  $0.25 \times 10^{-4}$

(b)  $2.5 \times 10^{-5}$

(c)  $4 \times 10^{10}$

(d)  $4 \times 10^{-5}$

16. Multiply the polynomials:  $(x - 1)(x + 3)$

**Solution:**  $\boxed{x^2 + 2x - 3}$

17. Square the binomial:  $(x - 5)^2$ .

**Solution:**  $x^2 - 10x + 25$ .

18. Multiply:  $(6x - 6)(x^2 + 2x + 3)$

**Circle the answer**

**Solution:**

(a)  $6x^3 + 18x^2 + 18x - 18$

(b)  $6x^3 + 6x^2 + 6x - 18$

(c)  $6x^3 + 18x^2 + 6x - 18$

(d)  $6x^3 + 6x^2 + 18x - 18$

19. Write in scientific notation.

0.0039

**Solution:**

$3.9 \times 10^{-3}$

20. Simplify the numerical expression

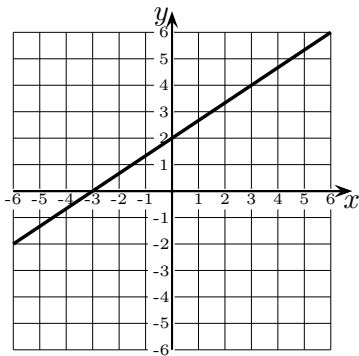
$$\left(\frac{10}{11}\right)^0.$$

**Solution:**  $1$ .

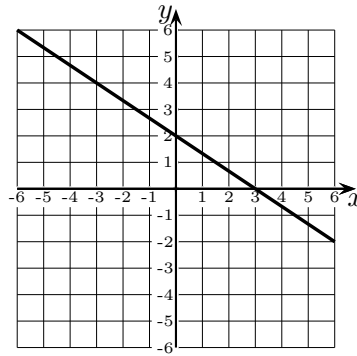
21. Which of the following is the graph of the equation  $2x - 3y = -6$ ? (Circle the answer).

Solution:

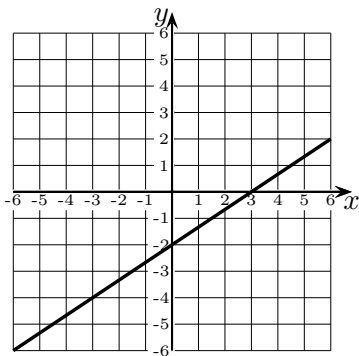
(a)



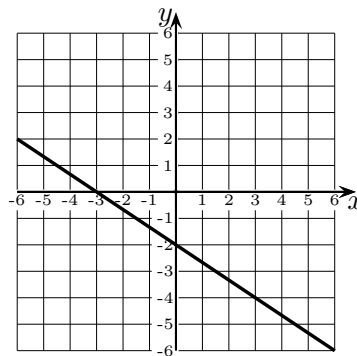
(c)



(b)



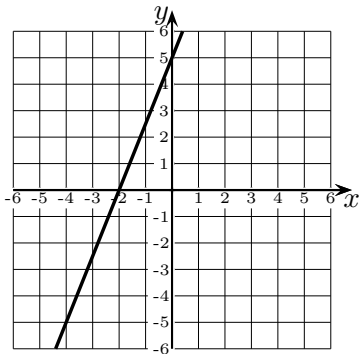
(d)



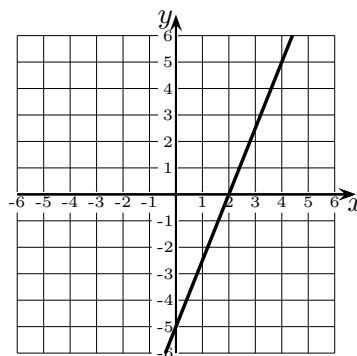
22. Which of the following is the graph of the equation  $10x - 4y = 20$ ? (Circle the answer).

Solution:

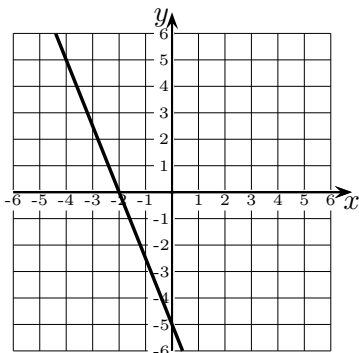
(a)



(c)



(b)



(d)

