

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

**Solution:**

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

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

**Solution:**  $\boxed{13x^2 + 8x + 1}$ .

12. Simplify the numerical expression

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

**Solution:**  $\boxed{1}$ .

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

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

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

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

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

**Solution:**  $x^2 + 2x - 3$

**16.** Write in scientific notation.

0.0039

**Solution:**

$3.9 \times 10^{-3}$

17. Write in scientific notation:

63400000

**Solution:**

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

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

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

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

**Solution:**

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

20. Write in decimal notation

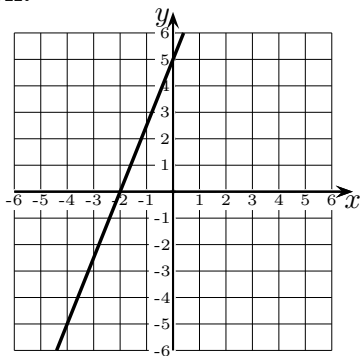
**Solution:**

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

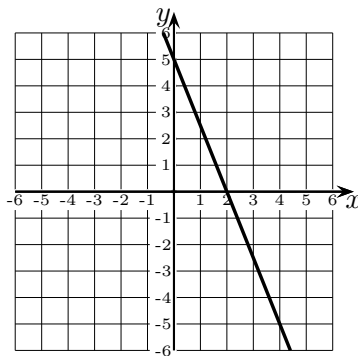
21. Which of the following is the graph of the equation  $10x - 4y = 20$ ? (Circle the answer).

**Solution:**

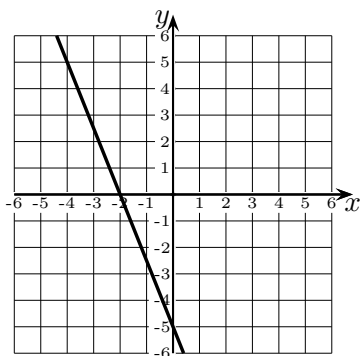
(a)



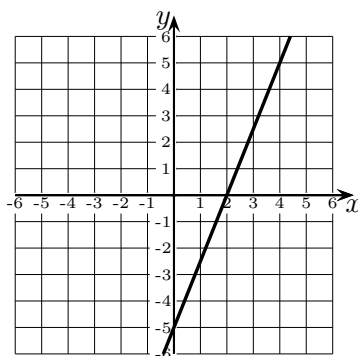
(c)



(b)



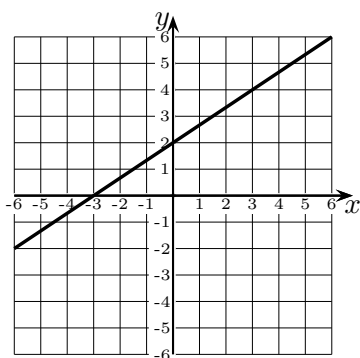
(d)



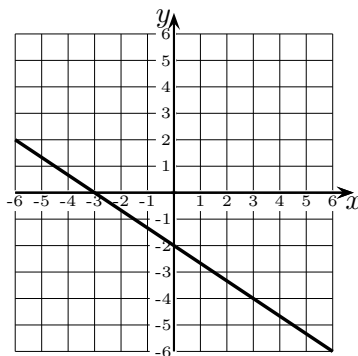
22. Which of the following is the graph of the equation  $2x - 3y = -6$ ? (Circle the answer).

**Solution:**

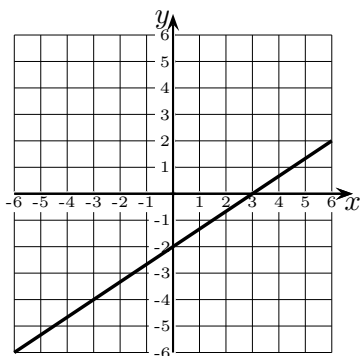
(a)



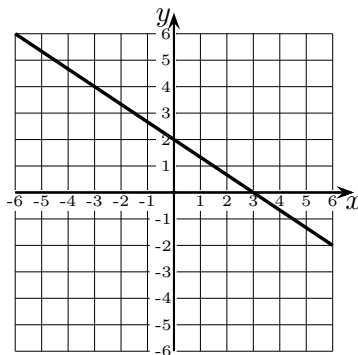
(c)



(b)



(d)



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

There are 22 questions. Some are multiple choice and some are free response.  
 Each question is worth 5 points, totaling 110 points.  
 Any points over 100 and up to 110 will count as extra credit.  
 For multiple-choice questions, just circle your answer.  
 For free-response questions, **SHOW ALL WORK** to receive credit.

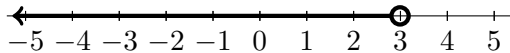
1. Solve the inequality and express the answer on the number line provided

$$6x - 14 + 2(x - 5) < 0.$$

**Solution:**

$$\begin{aligned} 6x - 14 + 2(x - 5) &< 0 \\ 6x - 14 + 2x - 10 &< 0 \quad (\text{distribute}) \\ 8x - 24 &< 0 \quad (\text{combine like terms}) \\ 8x &< 24 \quad (+24 \text{ to both sides}) \\ x &< 3 \quad (\div 8 \text{ on both sides}) \end{aligned}$$

The solution is therefore



2. Find

$$38 - (-30) + (-15) - 63.$$

**Solution:**

$$\begin{aligned} 38 - (-30) + (-15) - 63 \\ = 38 + 30 + (-15) - 63 \\ = 68 + (-15) - 63 \\ = 53 - 63 \\ = -10. \end{aligned}$$

3. Simplify:  $\frac{4}{5} \cdot \frac{7}{16} =$

**Solution:**  $\frac{4}{5} \cdot \frac{7}{16} = \frac{1}{5} \cdot \frac{7}{4} = \frac{7}{20}.$

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

**Solution:**

•  $f(0) = -2$

•  $f(2) = 20$

•  $f(-2) = 0$

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

•  $f(-x) = 3x^2 - 5x - 2$

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

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

6. Evaluate the expression:

$$9 + 3 \cdot 7 - (8 + 3 \cdot 6) =$$

**Solution:**

$$9 + 3 \cdot 7 - (8 + 3 \cdot 6) = 9 + 21 - (8 + 18) = 30 - 26 = 4$$

7. Solve:  $3(7x + 1) = 4(5x + 1) + 14$ .

**Circle the answer.**

(a)  $\frac{9}{20}$

(b)  $-13$

(c)  $15$

(d)  $\frac{21}{41}$

**Solution:**

$$\begin{aligned} 3(7x + 1) &= 4(5x + 1) + 14 \\ 21x + 3 &= 20x + 4 + 14 \quad (\text{distribute}) \\ 21x + 3 &= 20x + 18 \quad (\text{combine like terms}) \\ 21x &= 20x + 15 \quad (-3 \text{ from both sides}) \\ x &= 15 \quad (-20x \text{ from both sides}) \end{aligned}$$

8. Solve the equation  $8x - 7 = 2x - 3$ .

**Solution:**

$$\begin{aligned} 8x - 7 &= 2x - 3 \\ 8x - 7 &= 2x - 3 \quad (+7 \text{ to both sides}) \\ 6x &= 4 \quad (-2x \text{ from both sides}) \\ x &= \frac{4}{6} \quad (\div 6 \text{ on both sides}) \\ x &= \frac{2}{3} \quad (\text{Simplify.}) \end{aligned}$$

9. Simplify:  $\frac{1}{8} + \frac{1}{12} - \frac{1}{16} =$

**Solution:** The common denominator is 48:

$$\frac{1}{8} + \frac{1}{12} - \frac{1}{16} = \frac{6}{48} + \frac{4}{48} - \frac{3}{48} = \boxed{\frac{7}{48}}.$$

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**Solution:**

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

11. Simplify the numerical expression

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**Solution:**  $\boxed{1}.$

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a) Determine the coefficient and the degree of each term.

**Solution:**

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

b)

The degree of the polynomial is  $5$ ,

The leading term is  $x^5$ ,

The leading coefficient is  $1$ .

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

**Solution:**  $x^2 + 2x - 3$

16. Write in scientific notation.

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**Solution:**

$3.9 \times 10^{-3}$