

MTH 28.5, Test 1, V. 1, 09/24/26

Prof. Luis Fernández

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. Evaluate the expression:

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

Solution:

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

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

Circle the answer.

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

(b) 15

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

(d) -13

Solution:

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

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

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

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

Solution: The common denominator is 48:

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

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

Solution:

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

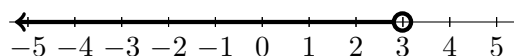
6. Solve the inequality and express the answer on the number line provided

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

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



7. Find

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

Solution:

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

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

Solution:

- $f(0) = \boxed{-2}$
- $f(2) = \boxed{20}$
- $f(-2) = \boxed{0}$
- $f(x + 1) = \boxed{3(x + 1)^2 + 5(x + 1) - 2}$
- $f(-x) = \boxed{3x^2 - 5x - 2}$

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

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

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

Solution: $\boxed{12x^3 - 11x^2 + 5x - 8}$

11. 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

12. Simplify the numerical expression

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

Solution: $\boxed{1}$.

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

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

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

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

Solution:

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

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

Solution:

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

15. Write in decimal notation

Solution:

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

16. Write in scientific notation:

63400000

Solution:

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

17. Write in scientific notation.

0.0039

Solution:

$$\boxed{3.9 \times 10^{-3}}$$

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

Circle the answer

Solution:

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

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

☒ (c) $6x^3 + 6x^2 + 6x - 18$

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

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

Solution: $\boxed{x^2 - 10x + 25}$.

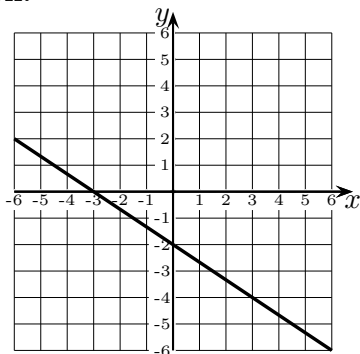
20. Multiply the polynomials: $(x - 1)(x + 3)$

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

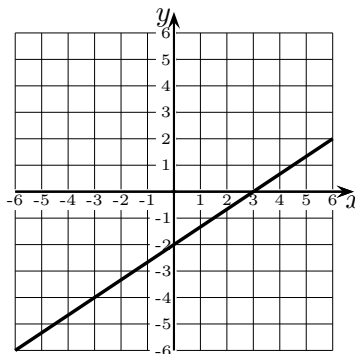
21. Which of the following is the graph of the equation $2x - 3y = -6$? (Circle the answer).

Solution:

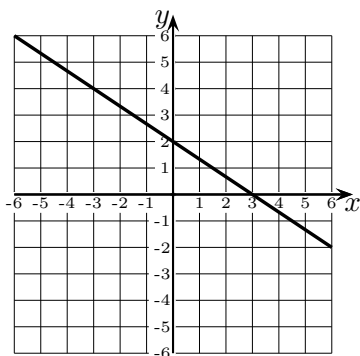
(a)



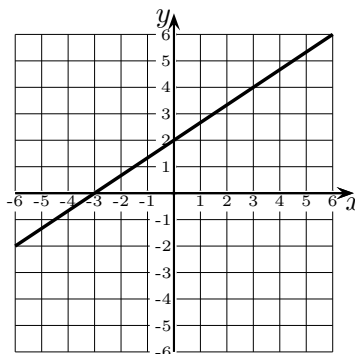
(c)



(b)



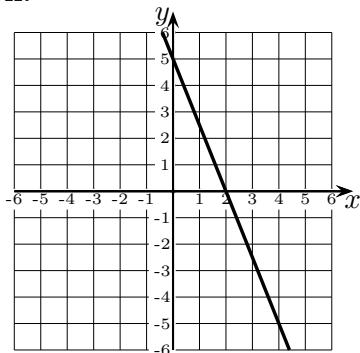
(d)



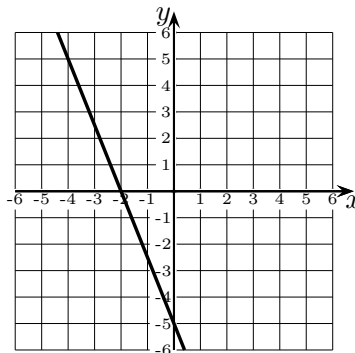
22. Which of the following is the graph of the equation $10x - 4y = 20$? (Circle the answer).

Solution:

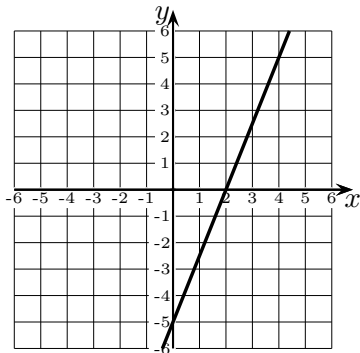
(a)



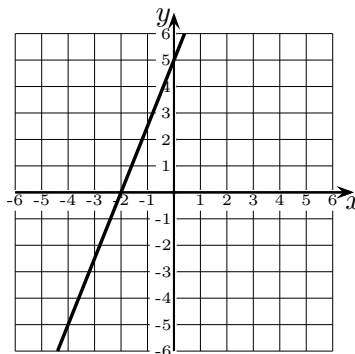
(c)



(b)



(d)



MTH 28.5, Test 1, V. 2, 09/24/26

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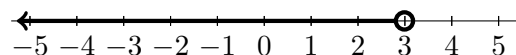
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