

Geometry Midterm
ALGEBRA and GEOMETRY REVIEW

NAME: _____

1. Write an equation of a line with a slope of $\frac{2}{3}$ whose graph will cross the y-axis at the point $(0, 12.65)$.

2. a. Solve for x and check your solution: $5x + 6 = 31$

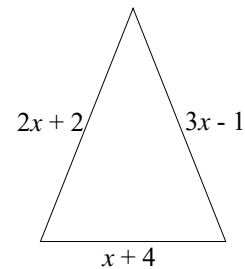
b. Simplify: $4x^2 - 10x - 3x^2 + 2x + 1$

3. The perimeter of the triangle at right is 23 cm.

a. Write an equation and solve for x .

b. What are the lengths of the sides of the triangle?

c. What kind of triangle is this? Explain.



4. Solve the following equations for x .

a. $\frac{x}{6} = \frac{11}{12}$

b. $\frac{42}{x} = \frac{32}{21}$

c. $\frac{12}{x} = \frac{x}{3}$

d. $\frac{x + 4}{6} = \frac{9}{20}$

5. Solve for x .

a. $x^2 - 6x + 8 = 0$

b. $2x^2 - 5x - 12 = 0$

6. Use the quadratic formula to solve this equation: $2x^2 + 3x - 3 = 0$.

7. Willis has just finished sorting all of his triangles in his collection into several boxes. The blue box contains only equilateral triangles. The green box contains only scalene triangles. The red box contains only isosceles right triangles, while the yellow box contains isosceles triangles that are not right. If Willis is to choose two triangles at random from each box, what is the probability the two chosen triangles are similar? Note: you need to answer for each box, and you may have to give a reasonable estimate for some.

8. Solve the following equations for x .

a. $\frac{x+5}{15} = \frac{2x+1}{12}$

b. $\frac{x+3}{6} = \frac{x+1}{2x+1}$

9. Solve for y and graph the line. State the slope and intercepts.

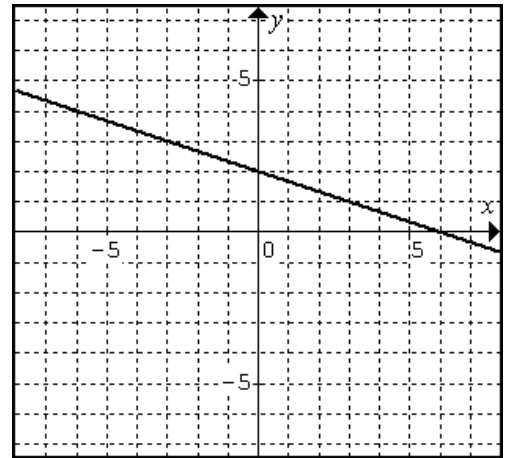
$$4x - 2y = 8$$

10. Solve each of the following:

a. $12 - 3x = -2(4 - x)$

b. $2x - (4 - 3x) = 12 + 3(x - 5)$

11. a. Find the equation of the line graphed.
b. Graph the line $2x - 3y = 12$ on the same grid.



12. Which of the following is a factor of $2x^2 - x - 6$?
- A. $x - 3$
 - B. $x - 6$
 - C. $x + 2$
 - D. $x - 2$
 - E. none of these

13. The solution(s) to $2x^2 - 50 = 0$ is/are.
- A. 5 only
 - B. 5 and -5
 - C. 2, 5, and -5
 - D. 2 and 25
 - E. none of these

14. To keep her pet groundhog Marley happy, Gwen built a rectangular pen for Marley with an area of 242 square feet. She only had 66 feet of fencing to use, and wanted the length to be twice as long as the width. What are the dimensions of the pen?

15. Use the quadratic formula to solve for x . Round your answer to 3 decimal places.

$$\frac{x+7}{x} = \frac{x}{2}$$

16. Find the equation of the line through the points $(-6, 3)$ and $(9, 8)$.

17. Find the equation of the line perpendicular to $y = -\frac{2}{3}x - 7$ that goes through $(6, -2)$.
18. Solve for x : $(x - 4)(x + 2) = 16$
19. If you graphed the line $y = \frac{2}{3}x + 1$ would the point $(60, 41)$ be on the line? Justify your answer completely.
20. One number is three times another number, and their sum is -10 . What is the smaller of the two numbers?

Use the following for the next three problems: Given $3x - 2y = -12$.

21. The y -intercept is
- A. $(0, 6)$
 - B. $(0, -6)$
 - C. $(0, -4)$
 - D. $(0, 4)$
 - E. None of these
22. The x -intercept is
- A. $(6, 0)$
 - B. $(-6, 0)$
 - C. $(-4, 0)$
 - D. $(4, 0)$
 - E. None of these
23. A line parallel is
- A. $y = \frac{2}{3}x - 7$
 - B. $y = \frac{3}{2}x + 5$
 - C. $y = -\frac{2}{3}x + 8$
 - D. $y = -\frac{3}{2}x + 1$
 - E. None of these

24. A line goes through the points $(5, -1)$ and $(7, -5)$. A line perpendicular to that line is
- A. $y = -\frac{1}{2}x + 6$
 - B. $y = 2x - 6$
 - C. $y = -2x - 4$
 - D. $y = \frac{1}{2}x + 1$
 - E. None of these
25. Given the system $\begin{cases} 2a + b = 3 \\ 3a - 2b = 8 \end{cases}$, what is the value of $a + b$?
- A. 11
 - B. 3
 - C. 1
 - D. -1
 - E. None of these
26. A line goes through the points $(-10, -23)$ and $(20, 37)$. Another point on the line is
- A. $(2, 19)$
 - B. $(2, -3)$
 - C. $(2, -53)$
 - D. $(2, 1)$
 - E. None of These
27. Find the equation for the line described.
- a. Line perpendicular to $y = \frac{2}{3}x + 6$, that goes through $(-6, 4)$
 - b. Line through the points: $(6, -3)$ and $(8, 2)$
28. Solve the system.
- $$3x + 2y = -23$$
- $$y = x - 4$$
29. Solve the equation for x : $5 - 2(x - 5) + 6 = 3 + 4(6 - x)$

Geometry Midterm

ALGEBRA AND GEOMETRY REVIEW ANSWERS (Stapled packet)

1. [$y = 2/3x + 12.65$]
2. [**a: $x = 5$, b: $x^2 - 8x + 1$**]
3. [**a: $2x + 2 + 3x - 1 + x + 4 = 23$, $x = 3$; b: 8, 8, and 7 cm; c: Isosceles since two sides are the same length.**]
4. [**a: $x = 5.5$, b: $x = 27.5625$, c: $x = \pm 6$, d: $x = -1.3$**]
5. [**a: $x = 4, 2$; b: $x = 4, -\frac{3}{2}$**]
6. [$x = \frac{-3 \pm \sqrt{33}}{4}$]
7. [**The probability of choosing similar triangles from the blue box (equilateral) is 1 since all equilateral triangles are similar. We cannot determine the probability of choosing similar triangles from the green box; some scalene are similar, but it isn't guaranteed. The probability of choosing similar triangles from the red box is also 1 since all isosceles right triangles are similar. And from the yellow box: we cannot determine since some may or may not be similar.**]
8. [**a: $x = 2.5$, b: $x = -1.5, 1$**]
9. [**$y = 2x - 4$, slope = 2, intercepts (0, -4) and (2, 0)**]
10. [**a: $x = 4$, b: $x = 1/2$**]
11. [**a: $y = -\frac{1}{3}x + 2$, b: $y = \frac{2}{3}x - 4$**]
12. [**D**]
13. [**B**]
14. [**11 feet by 22 feet**]
15. [**$x = 4.873$ or -2.873**]
16. [$y = \frac{1}{3}x + 5$]
17. [$y = \frac{3}{2}x - 11$]
18. [**$x = 6, -4$**]
19. [**Yes, since $(2/3) \cdot (60) + 1 = 40 + 1 = 41$, the point satisfies the equation, so the point is on the line.**]
20. [**-7.5**]
21. [**A**]
22. [**C**]
23. [**B**]
24. [**D**]
25. [**C**]
26. [**D**]
27. [**a: $y = -\frac{3}{2}x - 5$, b: $y = \frac{5}{2}x - 18$**]
28. [**$x = -3, y = -7$**]
29. [**$x = 3$**]