

Mathematics Entrance Exam Study Guide

You should only consider taking Geometry/Algebra II simultaneously if:

1. Math is one of your academic strengths.
2. You love doing lots of math.
3. You want to take Calculus II during your senior year.

If any of the three reasons do not apply to you - you should not take this exam.

Please use this as a review for the Geometry/Algebra II entrance exam. The following problems test many of the key concepts that you are expected to know prior to taking these courses concurrently.

You will not be permitted to use a calculator. The test consists of 50 questions to be completed in 60 minutes. In order to take these two courses, you must receive a scores of 85% or higher and be approved by the math department.

Simplify each expression.

1) $-9x + 5x$

2) $9(6a - 2)$

3) $8(6 + 10x) + 8x$

4) $-2(-8n + 4) + 3(-6 - 4n)$

Solve each equation.

5) $-2 - k = 11$

6) $-20 = \frac{b}{5}$

7) $5a + a = -18$

8) $-7(-7m + 2) = -210$

9) $39 = -6(2 - 6n) - 3(1 - 6n)$

10) $2 + 2x = 1 + 2x$

Solve each proportion.

11) $\frac{r-5}{10} = \frac{8}{2}$

12) $\frac{9}{5} = \frac{2}{n-1}$

Solve each equation by factoring.

13) $n^2 - 7n + 10 = 0$

14) $r^2 + 9r + 14 = 0$

Solve each equation. Remember to check for extraneous solutions.

15) $18 = \sqrt{\frac{n}{2}} + 10$

16) $\sqrt{7-n} = \sqrt{n-5}$

Solve each equation.

17) $\frac{v+2}{15} = -1$

18) $14 = 5 + \frac{v}{2}$

Simplify. Your answer should contain only positive exponents.

19) $3x^0y^3 \cdot 4x^0y^3$

20) $(2a^{-4})^4$

21) $\frac{3y^{-4}}{x^{-3}y^2}$

Factor the greatest common factor out of each expression.

22) $-90n^3 - 81n^2 - 90n$

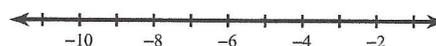
23) $30n^3 + 5n^4 - 25n^6$

Solve each inequality and graph its solution.

24) $135 \leq -3(8m + 3)$



25) $-8(b - 7) - 3b > 89$



Evaluate each expression.

26) $(4)((-10 - 2) \div ((2)(-1)))$

27) $((-6 - 1 - -2)(2)) \div 2$

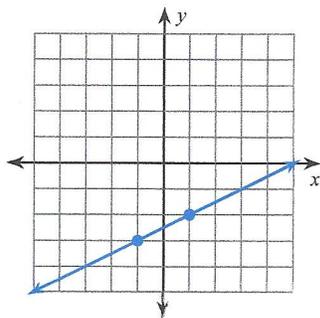
Evaluate each using the values given.

28) $(-)(q + q - p) - q$; use $p = -2$, and $q = 6$

29) $c^2 + c + a + c$; use $a = 1$, and $c = 4$

Find the slope of each line.

30)



Find the slope of the line through each pair of points.

31) $(-16, 10), (9, -1)$

32) $(-12, 10), (3, 2)$

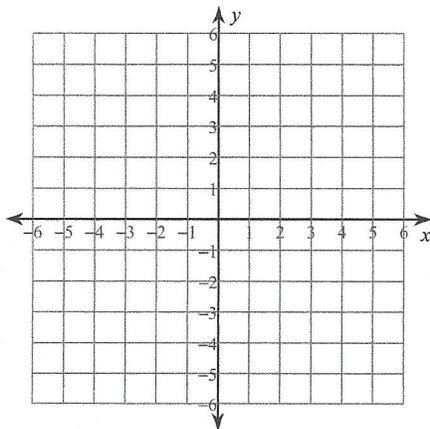
Find the slope of each line.

33) $y = -\frac{1}{5}x + 2$

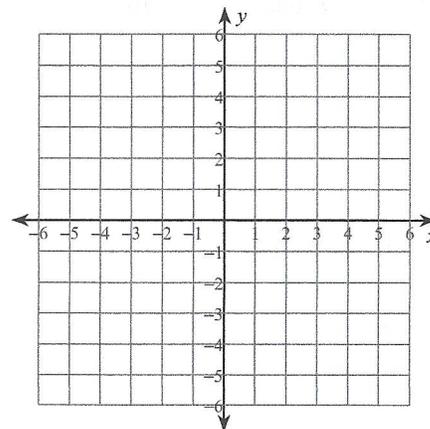
34) $x - 3y = 0$

Sketch the graph of each line.

35) x -intercept = 2, y -intercept = -3

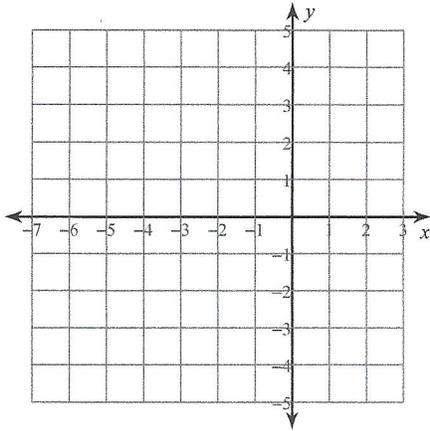


36) $y = -2x + 4$



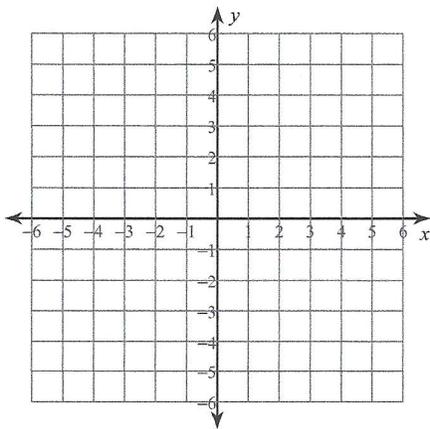
Sketch the graph of each function using a table.

37) $y = 2x^2 + 8x + 4$

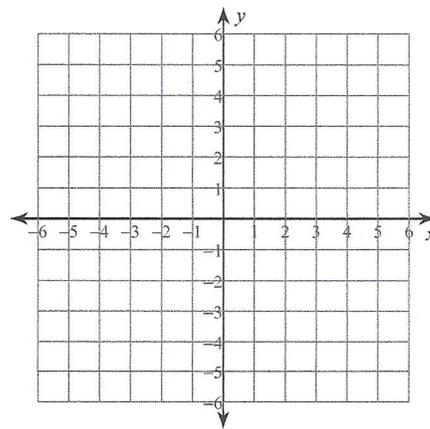


Sketch the graph of each line.

38) $y = 4$



39) $x = -3$



Find each product.

40) $(v + 2)(5v + 7)$

41) $(3b - 1)(7b - 4)$

Simplify each expression.

42) $(2b^3 + 7 - b) - (8b + 2b^3 + 3)$

43) $(5x^3 - 5x^2 - 3x^4) - (5x^2 - 7x^3 - x)$

Simplify.

44) $\sqrt{112}$

45) $\sqrt{192}$

46) $\sqrt{98}$

47) $\sqrt{72}$

Solve each equation with the quadratic formula.

48) $n^2 + 12n + 19 = 0$

Solve each system by substitution.

49) $y = -2x - 9$
 $y = 5x + 19$

Solve each system by elimination.

50) $-7x + 18y = -14$
 $-5x + 9y = -10$

Simplify.

51) $(-1)^2$

52) -5^2

53) $\frac{10}{0}$

54) $\frac{0}{10}$

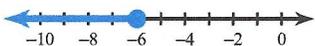
Answers to Mathematics Entrance Exam Study Guide

- | | | | |
|----------------|------------------|---------------|-------------------------|
| 1) $-4x$ | 2) $54a - 18$ | 3) $48 + 88x$ | 4) $4n - 26$ |
| 5) $\{-13\}$ | 6) $\{-100\}$ | 7) $\{-3\}$ | 8) $\{-4\}$ |
| 9) $\{1\}$ | 10) No solution. | 11) $\{45\}$ | 12) $\{2.11\}$ |
| 13) $\{5, 2\}$ | 14) $\{-2, -7\}$ | 15) $\{128\}$ | 16) $\{6\}$ |
| 17) $\{-17\}$ | 18) $\{18\}$ | 19) $12y^6$ | 20) $\frac{16}{a^{16}}$ |

21) $\frac{3x^3}{y^6}$

22) $-9n(10n^2 + 9n + 10)$

23) $5n^3(6 + n - 5n^3)$

24) $m \leq -6$:  A number line from -10 to 0 with tick marks every 1 unit. A solid blue circle is at -6, and a blue arrow points to the left from this circle.

25) $b < -3$:  A number line from -10 to 0 with tick marks every 1 unit. An open blue circle is at -3, and a blue arrow points to the left from this circle.

26) 24

27) -5

28) -20

29) 25

30) $\frac{1}{2}$

31) $-\frac{11}{25}$

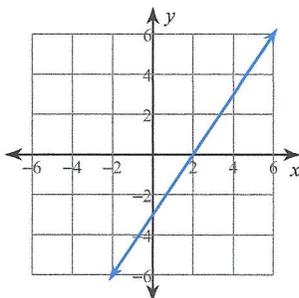
32) $-\frac{8}{15}$

33) $-\frac{1}{5}$

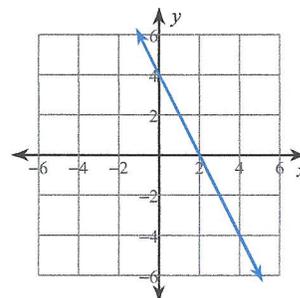
34) $\frac{1}{3}$

35)

36)

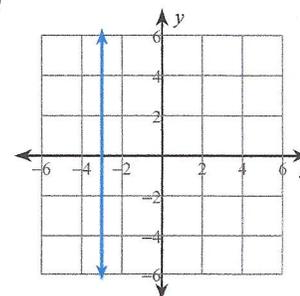
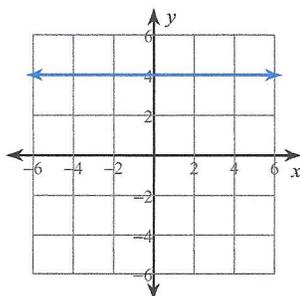
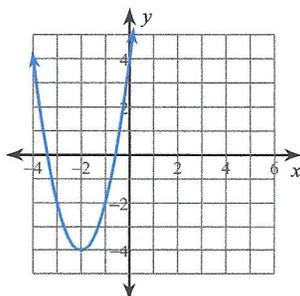


38)



39)

37)



40) $5v^2 + 17v + 14$

41) $21b^2 - 19b + 4$

42) $-9b + 4$

43) $-3x^4 + 12x^3 - 10x^2 + x$

44) $4\sqrt{7}$

45) $8\sqrt{3}$

46) $7\sqrt{2}$

47) $6\sqrt{2}$

48) $\{-6 + \sqrt{17}, -6 - \sqrt{17}\}$

49) $(-4, -1)$

50) $(2, 0)$

51) 1

52) -25

53) undefined

54) 0



