OAK HALL SCHOOL

2024-2025

Suggested Review Exercises
for students entering

College Algebra

Mathematics is a subject that is cumulative in nature as it constructs new knowledge from foundational prior knowledge. Therefore, as it is imperative to our students' success, we require them to have mastered certain skills and concepts before entering a new math course.

Each course in the math department has provided suggested exercises for incoming students as a resource for them to review the required prerequisites that are critical to their success in the course. While we will not be requiring students to complete these exercises as a formal assignment to be turned in, we have the highest expectations of our students as self-aware, proactive learners. Each student is responsible for gauging which prerequisites they need to reinforce and how much studying they need to do for them to start the new school year feeling confident, prepared, and accomplished.

We recommend that our students begin this process mid to late summer in order for everything to be fresh in their minds but also to give them time to recover from the school year they just completed. Rest is not an indulgence; it is a human necessity. We hope everyone has a safe, fun, and restful summer and we look forward to having another great school year when we come back in August!

College Algebra

Evaluate each using the values given.

1) $n^2m - 1$; use $m = 3$, and $n = -1$

2) $a^2 - c(c - a)$; use $a = -2$, and $c = 5$

3) $-4m(p - n) + n \div 4$; use $m = 2$, $n = 4$, and $p = 1$

Simplify each expression.

4) $-3 - 5(n + 4)$

5) $7x^2(4 - 6x) - 15x^2$

Simplify. Your answer should contain only positive exponents.

6) $a^2 \cdot 2a^4$

7) $\dfrac{2n^5}{10n^9}$

8) $\dfrac{2m^4}{4m^0}$

9) $4n^{-6} \cdot 5n^2$

10) $\dfrac{x}{4x^{-3}}$

11) $\left(4a^4\right)^3$

12) $\left(yx^3 \cdot x^3y^4\right)^3$

13) $\left(\dfrac{2uv}{2u^3v^3}\right)^3$

Write each number in scientific notation.

14) 0.02

Write each number in standard notation.

15) 4.66×10^4

Simplify.

16) $\sqrt{72}$

Simplify. Use absolute value signs when necessary.

17) $\sqrt{125x^4}$

18) $\sqrt{28x^3}$

Simplify.

19) $\sqrt{5} \cdot \sqrt{20}$

20) $5\sqrt{8} \cdot \sqrt{10}$

21) $\sqrt{10x^3} \cdot \sqrt{3x^2}$

22) $\dfrac{\sqrt{10}}{\sqrt{45}}$

23) $\dfrac{\sqrt{4}}{2\sqrt{3}}$

24) $\dfrac{5\sqrt{5n^2}}{4\sqrt{2n^2}}$

25) $\sqrt{6} + \sqrt{6}$

26) $-\sqrt{2} - 2\sqrt{2}$

27) $\sqrt{3} + \sqrt{12}$

28) $-2\sqrt{27} - 2\sqrt{3}$

29) $\dfrac{4}{5 + \sqrt{3}}$

30) $\dfrac{3}{\sqrt{2} + \sqrt{3}}$

Simplify each sum.

31) $\left(7r^3 + 4 + 8r^2 + 4r^4\right) + \left(-4 + 6r^3 - 3r^4\right)$

Simplify each difference.

32) $\left(v + 3v^2 - 4v^4\right) - \left(5v^3 + 8v^4 + 7v^2\right)$

Find each product.

33) $(2x + 8)(2x + 7)$

34) $(3k + 6)^2$

35) $(x - 5)(7x^2 - 4x + 5)$

Factor each completely.

36) $15v + 3v^2 + 24v^3$

37) $6y^3 - 4y^2x - 2y^2$

38) $2x^3 + 12x^2 - 7x - 42$

39) $12x^3 + 12x^2 + 18x + 18$

40) $k^2 - 13k + 42$

41) $2m^2 - 4m - 126$

42) $3v^2 + v - 30$

43) $35r^2 + 325r + 90$

44) $8n^2 + 18n + 9$

45) $x^2 - 16$

46) $k^2 + 1$

47) $4x^2 - 9$

State the excluded values for each.

48) $\dfrac{k - 5}{6k^2 - 30k}$

Simplify each expression.

49) $\dfrac{m + 8}{m^2 + m - 56}$

50) $\dfrac{a^2 - 5a - 14}{a^2 - 13a + 42}$

51) $\dfrac{2x}{3} \cdot \dfrac{4}{6x}$

52) $\dfrac{4a}{a + 3} \cdot \dfrac{a^2 + 5a + 6}{a + 2}$

53) $\dfrac{n + 7}{n^2 + n - 42} \cdot \dfrac{6n - 36}{2n - 10}$

54) $\dfrac{5}{9k^2} \div \dfrac{3}{10k}$

55) $\dfrac{6v^2 + 60v}{v + 9} \div \dfrac{v + 10}{v + 9}$

56) $\dfrac{r^2 + 2r - 3}{r^2 - 5r - 24} \div \dfrac{r^2 + 15r + 56}{r^2 - 64}$

57) $\dfrac{x + 4y}{4y^2} - \dfrac{5}{5x^3}$

58) $3 + \dfrac{4x}{15x^2}$

59) $\dfrac{6}{r + 5} + \dfrac{3}{r - 2}$

60) $\dfrac{p - 2}{2p^2 - 10p} - \dfrac{2}{2p}$

Answers to Summer Assignment

1) 2

2) -31

3) 25

4) $-23 - 5n$

5) $13x^2 - 42x^3$

6) $2a^6$

7) $\dfrac{1}{5n^4}$

8) $\dfrac{m^4}{2}$

9) $\dfrac{20}{n^4}$

10) $\dfrac{x^4}{4}$

11) $64a^{12}$

12) $y^{15}x^{18}$

13) $\dfrac{1}{u^6v^6}$

14) 2×10^{-2}

15) 46600

16) $6\sqrt{2}$

17) $5x^2\sqrt{5}$

18) $2|x|\sqrt{7x}$

19) 10

20) $20\sqrt{5}$

21) $x^2\sqrt{30x}$

22) $\dfrac{\sqrt{2}}{3}$

23) $\dfrac{\sqrt{3}}{3}$

24) $\dfrac{5\sqrt{10}}{8}$

25) $2\sqrt{6}$

26) $-3\sqrt{2}$

27) $3\sqrt{3}$

28) $-8\sqrt{3}$

29) $\dfrac{10 - 2\sqrt{3}}{11}$

30) $-3\sqrt{2} + 3\sqrt{3}$

31) $r^4 + 13r^3 + 8r^2$

32) $-12v^4 - 5v^3 - 4v^2 + v$

33) $4x^2 + 30x + 56$

34) $9k^2 + 36k + 36$

35) $7x^3 - 39x^2 + 25x - 25$

36) $3v(5 + v + 8v^2)$

37) $2y^2(3y - 2x - 1)$

38) $(2x^2 - 7)(x + 6)$

39) $6(2x^2 + 3)(x + 1)$

40) $(k - 7)(k - 6)$

41) $2(m - 9)(m + 7)$

42) $(3v + 10)(v - 3)$

43) $5(7r + 2)(r + 9)$

44) $(2n + 3)(4n + 3)$

45) $(x + 4)(x - 4)$

46) Not factorable

47) $(2x + 3)(2x - 3)$

48) $\{0, 5\}$

49) $\dfrac{1}{m - 7}$

50) $\dfrac{a + 2}{a - 6}$

51) $\dfrac{4}{9}$

52) $4a$

53) $\dfrac{3}{n - 5}$

54) $\dfrac{50}{27k}$

55) $6v$

56) $\dfrac{r - 1}{r + 7}$

57) $\dfrac{x^4 + 4x^3y - 4y^2}{4y^2x^3}$

58) $\dfrac{45x + 4}{15x}$

59) $\dfrac{9r + 3}{(r - 2)(r + 5)}$

60) $\dfrac{-p + 8}{2p(p - 5)}$