

2015-16 Analytic Geometry

Course Policy Sheet / Syllabus

Instructors

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Textbook: Each student will receive a copy of the new textbook 'Analytic Geometry – Georgia Edition 2014' by Holt McDougal.

Calculator Policy: Students will be allowed to use a calculator for this course. The appropriate calculators for this course are the - TI-30X IIS, or the TI-30XS MultiView™(recommended). TI-84 are also good calculators to use because these will be useful for future courses as well. Also, students are required to **obtain their own personal calculator** as they will not be provided by the school or teachers. Please visit the Calculator policy information on the following website for more information:

http://www.cobbk12.org/pope/calculator_policy.aspx

Course Breakdown: (subject to change)

Fall Semester

Extending the Number System (~ 3 weeks)
Quadratic Functions (~ 6 weeks)
Similarity, Congruence, and Proofs (~ 6 weeks)
Right Triangle Trig (~ 3 weeks)

Spring Semester

Circles and Volumes (~ 5 weeks)
Modeling with Geometry (~ 4 weeks)
Applications of Probability (~ 5 weeks)
Show what you know / Review (~ 2 weeks)

Grade Breakdown:

Assignments – 15% (homework, classwork, projects, anything other than a quiz or test)

Quizzes – 20%

Tests – 45%

Final Exam (EOC in spring) – 20%

Cheating Policy: Cheating is a serious offense and will result in a grade of zero for the assignment as well as referral to the administration. Cell phones are NOT to be on your desk at any time during class unless directed to be. Finishing a test or quiz before other students DOES NOT give a student the permission to use their cell phone for any purpose! You can refer to the academic honesty policies in the student handbook for more details.

Preparation/Organization for Class: Students should come to class with their textbook, binder, paper, pencils, and calculator every day. It is also recommended that each student use a separate/specific binder for this course. Students are required to take an EOC at the end of the school year and should be using material obtained throughout the year as additional study material.

Assignments: Each day students are given assignments to complete the mastery of the topics being studied. It is important to complete the assignments before the next class. Note that these are called assignments and not homework. There will be opportunities to work on assignments occasionally in class and throughout the school day; use your time wisely.

Attendance: It is important that students come to class daily. If a student misses class he or she is expected to obtain the notes and assignments for that day. If a test or quiz is missed students will take it at their teacher's convenience.

Behavior: Students are expected to manage their time, remain on task, follow instructions, be on time and be respectful in the classroom. No cell phone or music players are allowed to be used in the classroom unless approved by the instructor. Continuing use of a cell phone without the permission of the classroom teacher will result in referral to the administration.

Extra Help: Students are encouraged to seek extra help from the teacher as needed. Academic Opportunity is available as well as times before school most days. Please schedule a time with your teacher no later than the end of school the day before you would like to meet.

Geometry

Unit 1: Extending the Number System

Date	Topic/Classwork	Practice
Monday August 3	Simplifying Radicals (just numbers) pages 1-2	Pages 3 and 4
Tuesday August 4	Simplifying Radicals (variables included)- page 5	Pages 5 and 6
Wednesday August 5	Multiplying Radicals Page 7a	Pages 7 and 8
Thursday August 6	Dividing Radicals Page 9	Page 10
Friday August 7	Dividing Radicals (conjugate) Page 11a	Page 11
Monday August 10	Adding and Subtracting Radicals Page 12a	Pages 12 and 13
Tuesday August 11	Quiz Review Pages 14-15 QUIZ	Page 16

Simplifying Radicals

simplifying a radical means to find another expression with the same value

You need to remember:

Perfect Squares
4 = 2 x 2
9 = 3 x 3
16 = 4 x 4
25 = 5 x 5
36 = 6 x 6
49 = 7 x 7
64 = 8 x 8
81 = 9 x 9
100 = 10 x 10

Radicals (square roots)
$\sqrt{4} = 2$
$\sqrt{9} = 3$
$\sqrt{16} = 4$
$\sqrt{25} = 5$
$\sqrt{36} = 6$
$\sqrt{49} = 7$
$\sqrt{64} = 8$
$\sqrt{81} = 9$
$\sqrt{100} = 10$

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Steps:

1. Find the largest perfect square which will divide evenly into the number under your radical sign. This means that when you divide, you get no remainders, no decimals, no fractions.

2. If the number under your radical cannot be divided evenly by any perfect square then your radical is already in its simplest form.

#4 Simplify $\sqrt{40}$

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#5

Simplify $\sqrt{125}$

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#12

Simplify $\sqrt{200}$

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#15

Simplify $\sqrt{124}$

Aug 4-1:50 PM

#20

Simplify $\sqrt{180}$

Aug 4-1:50 PM

#39

Simplify $\sqrt{9x^2}$

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#41

Simplify $-\sqrt{28x^4}$

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#44

Simplify $-\sqrt{45x^2y^3}$

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Simplifying Radicals Worksheet 1

Simplify.

1) $\sqrt{75}$

2) $\sqrt{16}$

3) $\sqrt{36}$

4) $\sqrt{64}$

5) $\sqrt{80}$

6) $\sqrt{30}$

7) $\sqrt{8}$

8) $\sqrt{18}$

9) $\sqrt{32}$

10) $\sqrt{12}$

11) $\sqrt{8}$

12) $\sqrt{108}$

13) $\sqrt{125}$

14) $\sqrt{50}$

15) $\sqrt{175}$

16) $\sqrt{28}$

17) $\sqrt{45}$

18) $\sqrt{72}$

19) $\sqrt{20}$

20) $\sqrt{150}$



Why Didn't Krok Like to Go Sailing With the Baseball Uniform Designer?



Simplify each expression below and find your answer in the corresponding answer column. Write the letter of the exercise in the box that contains the number of the answer.

- L $\sqrt{8}$ I $\sqrt{45}$ A $\sqrt{50}$ T $\sqrt{12}$ O $\sqrt{98}$ S $\sqrt{48}$ E $\sqrt{125}$ A $\sqrt{20}$ S $\sqrt{72}$ Y $\sqrt{63}$ E $\sqrt{144}$ W $\sqrt{32}$ D $\sqrt{75}$ A $\sqrt{200}$

- 18 $7\sqrt{2}$ 14 $5\sqrt{5}$ 12 $2\sqrt{2}$ 4 $5\sqrt{2}$ 28 $4\sqrt{3}$ 20 $2\sqrt{3}$ 25 $3\sqrt{5}$ 8 $3\sqrt{7}$ 1 $6\sqrt{2}$ 7 $10\sqrt{2}$ 6 $4\sqrt{2}$ 22 $2\sqrt{5}$ 27 12 15 $5\sqrt{3}$

- S $5\sqrt{18}$ U $3\sqrt{28}$ A $2\sqrt{1000}$ P $\sqrt{1,000,000}$ E $3\sqrt{128}$ K $8\sqrt{27}$ L $4\sqrt{80}$ H $-3\sqrt{54}$ A $-7\sqrt{40}$ B $-8\sqrt{121}$ S $2\sqrt{500}$ T $-4\sqrt{24}$ Z $3\sqrt{175}$ C $5\sqrt{108}$

- 19 $6\sqrt{7}$ 13 $24\sqrt{3}$ 3 $24\sqrt{2}$ 9 $15\sqrt{2}$ 5 $16\sqrt{5}$ 23 1000 16 $20\sqrt{10}$ 10 $-8\sqrt{6}$ 21 $30\sqrt{3}$ 11 $-14\sqrt{10}$ 24 $20\sqrt{5}$ 26 $15\sqrt{7}$ 2 $-9\sqrt{6}$ 17 -88

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
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Homework Simplifying Radicals

Name _____

Class Time _____

Simplify each of the following expressions completely.

_____ 1. $\sqrt{64}$

_____ 2. $-\sqrt{18}$

_____ 3. $\sqrt{32}$

_____ 4. $\sqrt{50}$

_____ 5. $\sqrt{400}$

_____ 6. $\sqrt{x^6}$

_____ 7. $\sqrt{x^7}$

_____ 8. $\sqrt{16x^{16}}$

_____ 9. $\sqrt{9x^9}$

_____ 10. $\sqrt{40x^8}$

_____ 11. $\sqrt{25x^7}$

_____ 12. $\sqrt{12x^5}$

_____ 13. $\sqrt{a^2b^4}$

_____ 14. $\sqrt{49a^8x^{12}}$

_____ 15. $\sqrt{28x^9y^6}$

_____ 16. $\sqrt{32m^7n^{11}}$

_____ 17. $\sqrt{20x^{10}y^5}$

_____ 18. $\sqrt{100ab^4}$

_____ 19. $\sqrt{75x^8y^3}$

_____ 20. $\sqrt{98x^7y^5}$

_____ 21. $\frac{x^2+16x+83}{2x^2+19x+9}$

Homework: This worksheet

Answers to odd problems on worksheet:

1. 8

3. $4\sqrt{2}$

5. 20

7. $x^3\sqrt{x}$

9. $3x^4\sqrt{x}$

11. $5x^3\sqrt{x}$

13. ab^2

15. $2x^4y^3\sqrt{7x}$

17. $2x^5y^2\sqrt{5y}$

19. $5x^4y\sqrt{3y}$

21. $\frac{x+7}{2x+1}$

SIMPLIFYING RADICAL EXPRESSIONS

Perfect Squares: 1, 4, 9, 16, 25, ____, ____, ____, ____, ____, ____, 144...

x^2, x^4, x^6, \dots Exponents must be _____.

$\sqrt{25}$ is read "the square root of 25".

$\sqrt{25} = 5$ because $5^2 = 25$ $\sqrt{36} = 6$ because ____ = ____ $\sqrt{100} =$ ____ $\sqrt{49} =$ ____

$\sqrt{a^6} = a^3$ because $(a^3)^2 = a^6$ $\sqrt{m^{16}} = m^8$ because ____ = ____ $\sqrt{y^{10}} =$ ____ $\sqrt{a^2} =$ ____

Hint: Divide the exponent by _____.

In the expression \sqrt{a} , the $\sqrt{\quad}$ is called the radical and a is called the radicand.

Simplify (Simplifying Perfect Squares):

- | | | | | |
|------------------------|------------------|-----------------------|--------------------------|----------------------------|
| 1. $\sqrt{4}$ | 2. $\sqrt{16}$ | 3. $-\sqrt{100}$ | 4. $\sqrt{a^8}$ | 5. $\sqrt{w^{12}}$ |
| 6. $\sqrt{a^6 b^{10}}$ | 7. $\sqrt{9a^2}$ | 8. $-\sqrt{81m^{64}}$ | 9. $\sqrt{49a^4 b^{12}}$ | 10. $\sqrt{121x^{14} y^6}$ |

Simplify (Simplifying Radicals that are not Perfect Squares):

- | | | |
|---|---|---|
| 1. $\sqrt{20} = \sqrt{4} \cdot \sqrt{5} = 2\sqrt{5}$ | 2. $\sqrt{27} = \sqrt{9} \sqrt{3} = 3\sqrt{3}$ | 3. $\sqrt{48} = \sqrt{16} \sqrt{3} = 4\sqrt{3}$ |
| 4. $\sqrt{45} = \sqrt{\quad} \sqrt{\quad} = \underline{\quad} \sqrt{\quad}$ | 5. $\sqrt{12} = \sqrt{\quad} \sqrt{\quad} = \underline{\quad}$ | 6. $\sqrt{50} =$ |
| 7. $\sqrt{a^5} = \sqrt{a^4} \sqrt{a} = a^2 \sqrt{a}$ | 8. $\sqrt{x^9} = \sqrt{\quad} \sqrt{\quad} = \underline{\quad}$ | 9. $\sqrt{x^3} =$ |

Simplify:

- | | | | | |
|-------------------|----------------------|------------------------|---------------------------|-------------------------------|
| 1. $\sqrt{18}$ | 2. $\sqrt{125}$ | 3. $\sqrt{72}$ | 4. $\sqrt{180}$ | 5. $\sqrt{a^3}$ |
| 6. $\sqrt{b^7}$ | 7. $\sqrt{m^{11}}$ | 8. $\sqrt{75x^7 y^5}$ | 9. $\sqrt{27a^{11} b^7}$ | 10. $\sqrt{32a^7 b^4}$ |
| 11. $\sqrt{9a^8}$ | 12. $\sqrt{45a^7}$ | 13. $\sqrt{36x^2 y^6}$ | 14. $\sqrt{12x^{20} y^8}$ | 15. $-\sqrt{200}$ |
| 16. $\sqrt{196}$ | 17. $\sqrt{63x^4 y}$ | 18. $\sqrt{6x^3}$ | 19. $\sqrt{100x^5 y}$ | 20. $\sqrt{80x^{100} y^{49}}$ |

Why Did the Cow Give Only Buttermilk?

Simplify each expression below. Assume that all variables represent nonnegative numbers. Find your answer in the corresponding answer column. Write the letter of the exercise in the box that contains the number of the answer.

- | | | | |
|---------------------------------------|---------------------|---|--------------------------|
| (H) $\sqrt{5} \cdot \sqrt{3}$ | (7) $2x^2\sqrt{6}$ | (E) $5\sqrt{2} \cdot 4\sqrt{3}$ | (11) $5a^2\sqrt{3b}$ |
| (L) $\sqrt{6} \cdot \sqrt{2}$ | (2) $10\sqrt{2}$ | (V) $-7\sqrt{3} \cdot 2\sqrt{10}$ | (8) $-14\sqrt{15}$ |
| (C) $\sqrt{3} \cdot \sqrt{6}$ | (3) $12x^5$ | (T) $4\sqrt{10} (-3\sqrt{2})$ | (4) $36ab\sqrt{6b}$ |
| (E) $\sqrt{5} \cdot \sqrt{10}$ | (9) $\sqrt{15}$ | (A) $2\sqrt{8} \cdot \sqrt{18}$ | (17) $-24\sqrt{5}$ |
| (H) $\sqrt{10} \cdot \sqrt{20}$ | (12) $x\sqrt{6}$ | (R) $-10\sqrt{3} (-2\sqrt{21})$ | (15) $18ab$ |
| (M) $\sqrt{90} \cdot \sqrt{40}$ | (5) $3\sqrt{2}$ | (S) $-\sqrt{6} \cdot 7\sqrt{10}$ | (22) $40a^2b^4\sqrt{6a}$ |
| (I) $\sqrt{2x} \cdot \sqrt{3x}$ | (1) $3x^2\sqrt{10}$ | (B) $3\sqrt{ab} \cdot 6\sqrt{ab}$ | (6) 24 |
| (U) $\sqrt{6x} \cdot \sqrt{2x}$ | (23) $2\sqrt{3}$ | (E) $\sqrt{2ab^2} \cdot \sqrt{14ab^2}$ | (10) $20\sqrt{6}$ |
| (W) $\sqrt{30x^2} \cdot \sqrt{3x^2}$ | (21) 60 | (G) $-\sqrt{15a^2b} (-\sqrt{5a^2})$ | (19) $2ab^2\sqrt{7}$ |
| (N) $\sqrt{3x} \cdot \sqrt{8x^3}$ | (18) $20x\sqrt{x}$ | (K) $\sqrt{8ab^2} (-\sqrt{10a^3b^4})$ | (13) $-14\sqrt{30}$ |
| (H) $\sqrt{40x^2} \cdot \sqrt{10x}$ | (14) $5\sqrt{2}$ | (T) $2\sqrt{18a^2b} \cdot 6\sqrt{3b^2}$ | (24) $-4a^2b^3\sqrt{5}$ |
| (A) $\sqrt{12x^5} \cdot \sqrt{12x^5}$ | (16) $2x\sqrt{3}$ | (I) $5\sqrt{2a^3b^8} \cdot 4\sqrt{12a^2}$ | (20) $60\sqrt{7}$ |

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
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Multiplying Radical Expressions

Simplify.

1) $3\sqrt{12} \cdot \sqrt{6}$

2) $\sqrt{5} \cdot \sqrt{10}$

3) $\sqrt{6} \cdot \sqrt{6}$

4) $\sqrt{5} \cdot -4\sqrt{20}$

5) $-4\sqrt{15} \cdot -\sqrt{3}$

6) $\sqrt{20x^2} \cdot \sqrt{20x}$

7) $\sqrt{15n^2} \cdot \sqrt{10n^3}$

8) $\sqrt{18a^2} \cdot 4\sqrt{3a^2}$

9) $-3\sqrt{7r^3} \cdot 6\sqrt{7r^2}$

10) $-4\sqrt{28x} \cdot \sqrt{7x^3}$

11) $\sqrt{3}(5 + \sqrt{3})$

12) $2\sqrt{5}(\sqrt{6} + 2)$

13) $-3\sqrt{3}(2 + \sqrt{6})$

14) $\sqrt{3}(-5\sqrt{10} + \sqrt{6})$

15) $-2\sqrt{15}(-3\sqrt{3} + 3\sqrt{5})$

16) $5\sqrt{42x}(4 + 4\sqrt{7x})$

17) $\sqrt{14x}(3 - \sqrt{2x})$

18) $\sqrt{6n}(7n^3 + \sqrt{12})$

19) $\sqrt{3v}(\sqrt{6} + \sqrt{10})$

20) $\sqrt{21r}(5 + \sqrt{7})$

21) $(-2\sqrt{3} + 2)(\sqrt{3} - 5)$

22) $(5 - 4\sqrt{5})(-2 + \sqrt{5})$

23) $(-2 - 3\sqrt{5})(5 - \sqrt{5})$

24) $(\sqrt{5} - \sqrt{3})(\sqrt{5} + \sqrt{3})$

25) $(5\sqrt{2x} + \sqrt{5})(-4\sqrt{2x} + \sqrt{5x})$

26) $(-3\sqrt{3k} + 4)(\sqrt{3k} - 5)$

27) $(5 + 4\sqrt{3})(3 + \sqrt{3})$

28) $(3\sqrt{2} + \sqrt{5})(\sqrt{2} - 3\sqrt{5r})$

Did you hear about...

A	B	C	D	E	F	G	H
I	J	K	L	M	N	O	P
							?

Answers A–H:

$\sqrt{11}$	TO
$\frac{\sqrt{5}}{2}$	WAS
$\frac{\sqrt{2}}{6}$	HUG
$\frac{2\sqrt{10}}{5}$	TRIED
$4\sqrt{5}$	SAD
$\frac{5\sqrt{3}}{3}$	THE
$\frac{3\sqrt{5}}{10}$	BIG
$\frac{\sqrt{6}}{2}$	WHO
$\frac{\sqrt{3}}{2}$	KISS
$\frac{2\sqrt{7}}{7}$	VERY
$7\sqrt{2}$	GUY
$\frac{2\sqrt{6}}{3}$	GIRL

Rationalize the denominator and simplify each expression below. Find your answer in the adjacent answer column and notice the word next to it. Write this word in the box containing the letter of that exercise. Keep working and you will hear about a mistake.

- | | |
|----------------------------|-----------------------------------|
| (A) $\frac{5}{\sqrt{3}}$ | (I) $\frac{30}{\sqrt{18}}$ |
| (B) $\frac{2}{\sqrt{7}}$ | (J) $\frac{8}{\sqrt{20}}$ |
| (C) $\frac{20}{\sqrt{5}}$ | (K) $\frac{9}{2\sqrt{45}}$ |
| (D) $\frac{14}{\sqrt{2}}$ | (L) $\frac{\sqrt{7}}{\sqrt{3}}$ |
| (E) $\frac{3}{\sqrt{6}}$ | (M) $\frac{\sqrt{5}}{\sqrt{10}}$ |
| (F) $\frac{4}{\sqrt{10}}$ | (N) $\frac{3\sqrt{6}}{\sqrt{2}}$ |
| (G) $\frac{11}{\sqrt{11}}$ | (O) $\frac{\sqrt{3}}{2\sqrt{6}}$ |
| (H) $\frac{3}{\sqrt{12}}$ | (P) $\frac{2\sqrt{3}}{\sqrt{15}}$ |

Answers I–P:

$\frac{3\sqrt{2}}{4}$	BUT
$\frac{\sqrt{2}}{4}$	AND
$\frac{\sqrt{21}}{3}$	IN
$\frac{4\sqrt{5}}{5}$	GIRL
$\frac{6\sqrt{2}}{5}$	LOST
$3\sqrt{3}$	FOG
$\frac{3\sqrt{5}}{10}$	FRIEND
$\frac{\sqrt{2}}{2}$	THE
$5\sqrt{2}$	HIS
$\frac{2\sqrt{2}}{5}$	A
$\frac{2\sqrt{5}}{5}$	MIST
$\frac{9\sqrt{3}}{10}$	TODAY

Dividing Radical Expressions

Simplify.

1) $\frac{\sqrt{15}}{5\sqrt{20}}$

2) $\frac{\sqrt{8}}{\sqrt{100}}$

3) $\frac{\sqrt{6}}{\sqrt{27}}$

4) $\frac{3\sqrt{20}}{2\sqrt{4}}$

5) $\frac{4}{\sqrt{5}}$

6) $\frac{\sqrt{4}}{5\sqrt{3}}$

7) $\frac{\sqrt{5}}{\sqrt{3}}$

8) $\frac{\sqrt{2}}{2\sqrt{3}}$

9) $\frac{\sqrt{3x^2y^3}}{4\sqrt{5xy^3}}$

10) $\frac{\sqrt{15xy}}{3\sqrt{10xy^3}}$

11) $\frac{3 - 3\sqrt{3a}}{4\sqrt{8a}}$

12) $\frac{3n^2 + \sqrt{2n^2}}{\sqrt{10n}}$

Extra Practice - Dividing Radical Binomials (Conjugate)

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Simplify.

1) $\frac{5}{-7+5\sqrt{5}}$

2) $\frac{4}{3-\sqrt{6}}$

3) $\frac{5}{7+\sqrt{5}}$

4) $-\frac{3}{6+7\sqrt{6}}$

5) $\frac{6}{-5-2\sqrt{5}}$

6) $-\frac{2}{5-\sqrt{5}}$

7) $\frac{4}{-2-5\sqrt{5}}$

8) $\frac{5}{7-3\sqrt{6}}$

9) $\frac{6}{-1+\sqrt{7}}$

10) $\frac{5}{-6-\sqrt{6}}$

11) $\frac{-2+\sqrt{3}}{-3+\sqrt{7}}$

12) $\frac{-6-\sqrt{3}}{5-3\sqrt{2}}$

13) $\frac{2+4\sqrt{5}}{\sqrt{5}-\sqrt{3}}$

14) $\frac{5+\sqrt{6}}{4-\sqrt{2}}$

15) $\frac{-5+6\sqrt{3}}{\sqrt{2}+5}$

16) $\frac{5+7\sqrt{2}}{7+\sqrt{7}}$

17) $\frac{7-\sqrt{5}}{2-\sqrt{7}}$

18) $\frac{-5+3\sqrt{5}}{3-\sqrt{3}}$

19) $\frac{-7+6\sqrt{7}}{5-2\sqrt{5}}$

20) $\frac{6+7\sqrt{6}}{4+3\sqrt{6}}$

13) $\frac{4x^3 - 3\sqrt{3x}}{3\sqrt{3x^2}}$

14) $\frac{\sqrt{5k^4} + 3\sqrt{2k}}{\sqrt{3k^3}}$

15) $\frac{3}{4 + 4\sqrt{5}}$

16) $\frac{5}{-5 - 3\sqrt{3}}$

17) $\frac{5}{-3 - 3\sqrt{3}}$

18) $\frac{4}{\sqrt{2} - 5\sqrt{3}}$

19) $\frac{2 + 5\sqrt{3}}{-4 + 4\sqrt{2}}$

20) $\frac{\sqrt{5} + 2\sqrt{2}}{4 - \sqrt{5}}$

21) $\frac{\sqrt{5} + 3}{4 - \sqrt{5}}$

22) $\frac{3 - 4\sqrt{3}}{4\sqrt{5} + 3\sqrt{2}}$

What Should You Do If Nobody Will Sing With You?



Simplify each expression. Find your answer below the exercise and notice the letter next to it. Write this letter in the box at the bottom of the page that contains the number of that exercise.

① $2\sqrt{5} + 4\sqrt{5}$

② $7\sqrt{3} - 3\sqrt{3}$

③ $2\sqrt{6} - 7\sqrt{6}$

④ $5\sqrt{x} + \sqrt{x}$

⑤ $9\sqrt{5} - 8\sqrt{5}$

Ⓕ $4\sqrt{5}$

Ⓔ $4\sqrt{3}$

Ⓘ $6\sqrt{x}$

Ⓡ $3\sqrt{x}$

Ⓣ $6\sqrt{5}$

Ⓝ $6\sqrt{3}$

Ⓐ $\sqrt{5}$

Ⓤ $-5\sqrt{6}$

⑥ $5\sqrt{10} + 4\sqrt{10} - \sqrt{10}$

⑦ $2\sqrt{3} - 6\sqrt{3} - 3\sqrt{3}$

⑧ $6\sqrt{7} + 3\sqrt{3} - 2\sqrt{7}$

⑨ $\sqrt{2} - 4\sqrt{6} + 5\sqrt{2} + \sqrt{6}$

⑩ $3\sqrt{a} + 9\sqrt{b} - \sqrt{b} - 2\sqrt{a}$

ⓓ $8\sqrt{3}$

Ⓢ $4\sqrt{2} - \sqrt{6}$

Ⓔ $8\sqrt{10}$

Ⓕ $4\sqrt{7} + 3\sqrt{3}$

Ⓡ $\sqrt{a} + 8\sqrt{b}$

Ⓐ $3\sqrt{a} + 7\sqrt{b}$

Ⓣ $-7\sqrt{3}$

Ⓨ $6\sqrt{2} - 3\sqrt{6}$

⑪ $3\sqrt{12} + 4\sqrt{3}$

⑫ $8\sqrt{5} - 2\sqrt{45}$

⑬ $7\sqrt{18} + 2\sqrt{50}$

⑭ $6\sqrt{24} - 5\sqrt{54}$

⑮ $-\sqrt{27} + 4\sqrt{48}$

Ⓡ $-3\sqrt{6}$

Ⓔ $10\sqrt{3}$

Ⓢ $-4\sqrt{3}$

Ⓕ $2\sqrt{6}$

Ⓣ $2\sqrt{5}$

Ⓝ $13\sqrt{3}$

Ⓔ $24\sqrt{2}$

Ⓞ $31\sqrt{2}$

⑯ $5\sqrt{8} + \sqrt{98} - 2\sqrt{18}$

⑰ $2\sqrt{90} - 3\sqrt{20} + \sqrt{40}$

⑱ $4\sqrt{63} - 9\sqrt{28} + 2\sqrt{44}$

⑲ $2\sqrt{27x} + \sqrt{75x} + 5\sqrt{12x}$

⑳ $-6\sqrt{9x} + 3\sqrt{64x} - \sqrt{50x}$

Ⓑ $8\sqrt{3x}$

Ⓤ $6\sqrt{x} - 5\sqrt{2x}$

Ⓕ $11\sqrt{2}$

Ⓢ $-6\sqrt{7} + 4\sqrt{11}$

Ⓢ $\sqrt{10} - 9\sqrt{5}$

Ⓓ $8\sqrt{10} - 6\sqrt{5}$

Ⓚ $21\sqrt{3x}$

Ⓟ $3\sqrt{7} + \sqrt{11}$

10	2	15	7	5	17	20	11	1	9	13	3	14	18	6	16	8	19	4	12
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Adding and Subtracting Radical Expressions

Simplify.

1) $3\sqrt{6} - 4\sqrt{6}$

2) $-3\sqrt{7} + 4\sqrt{7}$

3) $-11\sqrt{21} - 11\sqrt{21}$

4) $-9\sqrt{15} + 10\sqrt{15}$

5) $-10\sqrt{7} + 12\sqrt{7}$

6) $-3\sqrt{17} - 4\sqrt{17}$

7) $-10\sqrt{11} - 11\sqrt{11}$

8) $-2\sqrt{3} + 3\sqrt{27}$

9) $2\sqrt{6} - 2\sqrt{24}$

10) $2\sqrt{6} + 3\sqrt{54}$

11) $-\sqrt{12} + 3\sqrt{3}$

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

13) $3\sqrt{8} + 3\sqrt{2}$

14) $-3\sqrt{6} + 3\sqrt{6}$

$$15) -3\sqrt{20} - \sqrt{5}$$

$$16) 2\sqrt{45} - 2\sqrt{5}$$

$$17) 3\sqrt{18} - 2\sqrt{2}$$

$$18) -3\sqrt{18} + 3\sqrt{8} - \sqrt{24}$$

$$19) 3\sqrt{18} + 3\sqrt{12} + 2\sqrt{27}$$

$$20) -3\sqrt{5} - \sqrt{6} - \sqrt{5}$$

$$21) -3\sqrt{2} + 3\sqrt{20} - 3\sqrt{8}$$

$$22) -3\sqrt{3} - \sqrt{8} - 3\sqrt{3}$$

$$23) -2\sqrt{20} + 2\sqrt{18} - 2\sqrt{5}$$

$$24) 2\sqrt{18} - 2\sqrt{12} + 2\sqrt{18}$$

$$25) -\sqrt{45} + 2\sqrt{5} - \sqrt{20} - 2\sqrt{6}$$

$$26) 2\sqrt{20} - \sqrt{20} + 3\sqrt{20} - 2\sqrt{45}$$

$$27) -3\sqrt{45} + 2\sqrt{12} + 3\sqrt{6} - 3\sqrt{20}$$

$$28) -\sqrt{27} - 3\sqrt{45} - \sqrt{20} + 2\sqrt{45}$$

Name: _____

Radicals Quiz: Simplify Each Expression Completely

1.) $\sqrt{72}$ a.) $3\sqrt{8}$ b.) $6\sqrt{2}$ c.) $9\sqrt{8}$ d.) $\sqrt{72}$

2.) $\sqrt{27}$ a.) 9 b.) $\sqrt{27}$ c.) $5\sqrt{2}$ d.) $3\sqrt{3}$

3.) $\sqrt{45}$ a.) $8\sqrt{5}$ b.) $2\sqrt{5}$ c.) $9\sqrt{5}$ d.) $3\sqrt{5}$

4.) $\sqrt{144}$ a.) $12\sqrt{2}$ b.) $4\sqrt{8}$ c.) 12 d.) $5\sqrt{9}$

5.) $3\sqrt{6} - 4\sqrt{6}$ a.) $-7\sqrt{6}$ b.) $-\sqrt{6}$
c.) $-11\sqrt{12}$ d.) -1

6.) $5\sqrt{11} + 6\sqrt{11}$ a.) $11\sqrt{11}$ b.) $11\sqrt{22}$
c.) $\sqrt{11}$ d.) $30\sqrt{22}$

7.) $3\sqrt{3} + \sqrt{27}$ a.) 0 b.) $3\sqrt{30}$
c.) $6\sqrt{3}$ d.) $9\sqrt{3}$

8.) $2\sqrt{6} - 2\sqrt{25}$ a.) $-10 + 2\sqrt{6}$ b.) $-8\sqrt{6}$
c.) 0 d.) $-\sqrt{19}$

9.) $-3\sqrt{20} - \sqrt{5}$ a.) $-4\sqrt{15}$ b.) $-7\sqrt{5}$
c.) $-6\sqrt{5}$ d.) -6

10.) $5\sqrt{5} + 2\sqrt{45} + 3\sqrt{5}$ a.) $4\sqrt{55}$ b.) $4\sqrt{45}$
c.) $8\sqrt{5}$ d.) Not Given

Continued on back

11.) $3\sqrt{12} \cdot \sqrt{6}$

a.) $3\sqrt{18}$

b.) $18\sqrt{2}$

c.) $7\sqrt{24}$

d.) $12\sqrt{36}$

12.) $\sqrt{3}(5+\sqrt{3})$

a.) $\sqrt{15}+3$

b.) 15

c.) $\sqrt{15}+9$

d.) $5\sqrt{3}+3$

13.) $(\sqrt{5}-\sqrt{3})(\sqrt{5}+\sqrt{3})$

Use FOIL!

a.) $\sqrt{15}-3$

c.) $2\sqrt{15}$

b.) 2

d.) 5

14.) $(5+4\sqrt{3})(3+\sqrt{3})$

Use FOIL!

a.) 18

b.) $25+16\sqrt{12}$

c.) 27

d.) $27+17\sqrt{3}$

15.) $\frac{4}{\sqrt{5}}$

a.) $\frac{4\sqrt{5}}{5}$

b.) $\frac{20}{\sqrt{5}}$

c.) 0.8

d.) 4

16.) $\frac{\sqrt{12}}{5\sqrt{3}}$

a.) $\frac{2}{5\sqrt{3}}$

b.) $\frac{2\sqrt{3}}{5}$

c.) $\frac{2\sqrt{3}}{15}$

d.) $\frac{2\sqrt{3}}{3}$

17.) $\frac{3}{4+4\sqrt{5}}$

a.) $\frac{\sqrt{5}}{-64}$

b.) $\frac{12-\sqrt{5}}{-64}$

c.) $\frac{3-\sqrt{5}}{16}$

d.) $\frac{-3+3\sqrt{5}}{16}$

18.) $\frac{\sqrt{2}+5}{\sqrt{3}-\sqrt{2}}$

a.) $\frac{\sqrt{6}+5\sqrt{2}}{5}$

b.) $\sqrt{6}+2+5\sqrt{3}+5\sqrt{2}$

c.) $\frac{\sqrt{6}+2+5\sqrt{3}}{5}$

d.) $\sqrt{6}+5\sqrt{2}$

What Did Bimbo Airhead Reply When Asked, "What Is the Difference Between Ignorance and Apathy?"

Simplify each expression below. Assume that all variables represent nonnegative numbers. Cross out the box that contains your answer. When you finish, print the letters from the remaining boxes in the spaces at the bottom of the page.

- ① $\sqrt{3} \cdot \sqrt{15}$
- ② $\sqrt{10x} \cdot \sqrt{5x^3}$
- ③ $7\sqrt{3} + \sqrt{48}$
- ④ $\frac{24}{\sqrt{6}}$
- ⑤ $-5\sqrt{3} \cdot 4\sqrt{6}$
- ⑥ $\sqrt{2xy^2} \cdot \sqrt{10xy}$
- ⑦ $8\sqrt{x} + 3\sqrt{y} - \sqrt{x}$
- ⑧ $\frac{12}{\sqrt{30}}$

- ⑨ $\frac{\sqrt{5}}{\sqrt{40}}$
- ⑩ $\sqrt{3nt^5} \cdot \sqrt{12n^2t}$
- ⑪ $5\sqrt{24} - 8\sqrt{150}$
- ⑫ $\frac{4\sqrt{10}}{\sqrt{6}}$
- ⑬ $3\sqrt{2n^9t^5} \cdot 5\sqrt{14n^5}$
- ⑭ $7\sqrt{12} - 5\sqrt{27} + 6\sqrt{300}$
- ⑮ $4\sqrt{44} + 2\sqrt{22} + 9\sqrt{99}$
- ⑯ $\frac{3\sqrt{2}}{2\sqrt{75}}$

Answers for exercises 1–8:

TH	IDO	ERE	THE
$2xy\sqrt{5y}$	$\frac{3\sqrt{30}}{10}$	$4\sqrt{6}$	$\frac{2\sqrt{30}}{5}$
SO	DUM	NOW	BAS
$7\sqrt{x} + 3\sqrt{y}$	$11\sqrt{3}$	$9\sqrt{2xy}$	$3\sqrt{5}$
ON	TOP	IT	TCA
$-30\sqrt{3}$	$-60\sqrt{2}$	$5x^2\sqrt{2}$	$9\sqrt{6}$

Answers for exercises 9–16:

ONE	WA	NTK	ISS
$30n^4t^2\sqrt{7t}$	$-30\sqrt{6}$	$\frac{2\sqrt{30}}{3}$	$\frac{\sqrt{6}}{10}$
AN	AS	AYS	DID
$24n^2t^3\sqrt{2t}$	$6nt^3\sqrt{n}$	$59\sqrt{3}$	$42\sqrt{11}$
USE	ME	RE	ST
$35\sqrt{11} + 2\sqrt{22}$	$\frac{\sqrt{2}}{4}$	$36\sqrt{3}$	$\frac{4\sqrt{15}}{3}$

OBJECTIVE 3-I: To simplify products, sums, differences, and quotients containing radicals (review of preceding three pages).