Radicals in Review and other Material

This chapter has videos on my website for nearly every section. Students may need to look up a few small items but the vast majority of this entire chapter is there for reference. Please work through each section using your own paper to show the work.

Google "Criswell Math" to find the website.

Lesson: Simplifying Radicals (Part A)

1a. $\sqrt{54a^2b^3}$ 1b. $\sqrt{75x^3y^3}$ 1c. $\sqrt{27a^4b^2}$ 1d. $\sqrt{360xy^2z^9}$

2a. $\sqrt[3]{135x^5y^6}$ 2b. $\sqrt[3]{40h^6k^4}$

3a. $(50d^3e^2)^{\frac{1}{2}}$ 3a. $(18x^8y^6)^{\frac{1}{2}}$

4a. $(72j^3k^5)^{\frac{1}{3}}$ 4a. $(64h^{12}m^6)^{\frac{1}{5}}$

Lesson: Combining Radicals (Part B)

5a. $3\sqrt{12}+5\sqrt{8}-4\sqrt{75}$ 5b. $2\sqrt{27}+5\sqrt{12}-7\sqrt{75}$

6a. $8\sqrt{20}-3\sqrt{45}-8\sqrt{27}+4\sqrt{108}$ 6b. $9\sqrt{50}-2\sqrt{8}-4\sqrt{75}+7\sqrt{108}$

7. $6\sqrt[3]{54}-11\sqrt[3]{24}+\sqrt[3]{250}$

Lesson: Multiplying Radicals (Part C)

8a. $2\sqrt{5}\left(3\sqrt{2}-7\right)$ 8b. $3\sqrt{3}\left(5\sqrt{6}-4\right)$

9a. $4\sqrt{6}\left(2\sqrt{42}-8\sqrt{30}\right)$ 9b. $2\sqrt{5}\left(7\sqrt{15}-3\sqrt{10}\right)$

10a. $\left(3\sqrt{5}-2\sqrt{2}\right)\left(3\sqrt{10}+5\sqrt{6}\right)$ 10b. $\left(4\sqrt{2}-2\sqrt{3}\right)\left(3\sqrt{6}+10\sqrt{8}\right)$

11a. $\left(2\sqrt{14}-3\right)\left(4\sqrt{7}+5\sqrt{2}\right)$ 11b. $\left(3\sqrt{18}-6\right)\left(4\sqrt{6}+9\sqrt{3}\right)$

Lesson: Rationalizing Denominators (Part D)

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

13. $\frac{2\sqrt{6}}{\sqrt{12}}$

14. $\frac{8\sqrt{3}}{\sqrt{2}}$

15. $\frac{3}{\sqrt{5}}$

16. $\sqrt{\frac{49}{225}}$

17. $\frac{5\sqrt{3}}{\sqrt{10}}$

Lesson: Using Conjugates (Part E)

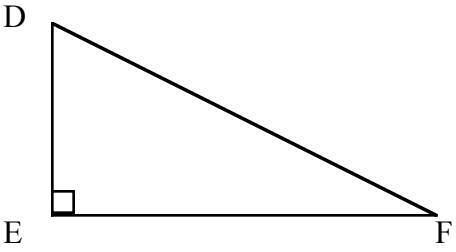
18. $\frac{2}{7+\sqrt{3}}$

19. $\frac{4}{2-\sqrt{10}}$

20. $\frac{2\sqrt{6}}{\sqrt{3}-\sqrt{11}}$

21. $\frac{10\sqrt{2}}{\sqrt{36}-\sqrt{2}}$

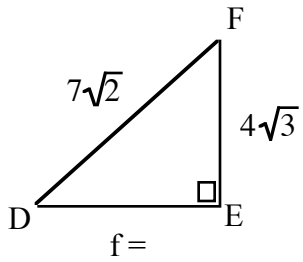
Lesson: Pythagorean Theorem (Part F)



22. If d = 8, e = 12, find f.

23. If f = 9, d = 5, find e.

24.



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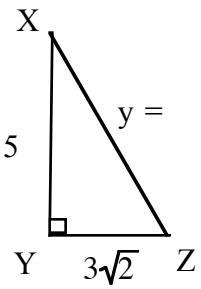


Sub-lesson: on Pythagorean Triples
Do not use the Pythagorean theorem in the traditional sense but rather use the knowledge of those special triples to find the lenth of the missing side. One could look up "common Pythagorean triples" if those ratios are not known.

26. Given legs k = 15, p = 20, what is the length of hyp t?

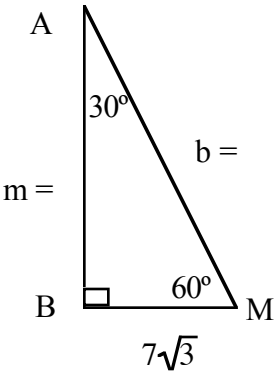
27. Given leg m = 10, hypoteneuse n = 26, what is the length of leg q?

28. Given legs a = 14, b = 28, what is the length of hyp c?

29. Given leg q = 21, hypoteneuse r = 75, what is the length of leg s?

Sub-lesson: on Special Right Triangles (In Class Lesson)
This section does not require trig, in fact any answers with decimals will be considered wrong! Exact solutions in radical form are what is desired.

30.



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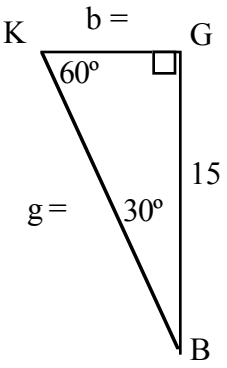

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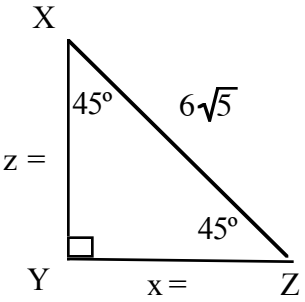

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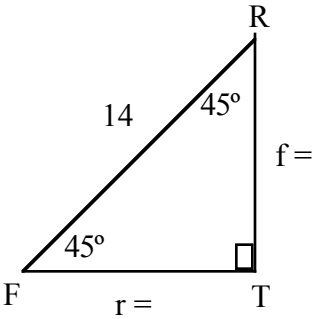

35. The altitude of an equilateral triangle is 5 cm. What is the length of a side of the triangle?

Lesson: Classifying Triangles (Part G)

36. 5, 7, 9 **37.** 14, 48, 50 **38**. $3\sqrt{5}$, $5\sqrt{6}$, 15 **39.** $2\sqrt{3}$, $3\sqrt{5}$, $\sqrt{57}$ **40.** 2, 9, 15

Lesson: Right Triangle Trigonometry (Part H)

41. A plane is flying at an elevation of 35, 000 feet within sight of the Gateway Arch in St. Louis, Missouri. The pilot would like to estimate her distance from the Arch. She finds that the angle of depression to a point on the ground below the arch is 32˚.

(a) What is the distance between the plane and the arch?

(b) What is the distance between a point on the ground directly below the plane and the arch? (along the ground)

42. From the top of a 200 foot lighthouse, the angle of depression to a ship on the ocean is 14˚. How far is the ship from the base of the lighthouse?

43. A 20 foot ladder leans against a building so that the angle between the ground and the ladder is 55˚. How high does the ladder reach on the building?

44. Find the altitude of an isosceles triangle with base 4.24 feet. The vertex angle of the triangle measures 64˚ .

Lesson: Distance Formula (Part I)

45. A(–3 , 5) B(2, 7) Find $\overline{AB}$.

46. C(–2 , – 4) D(3, – 9) Find $\overline{CD}$.

47. X(0 , 11) Y(4, –2) Find $\overline{XY}$.

Lesson: The Quadratic Formula (In Class Lesson)

Use the **discriminant** to identify the type of solutions, then use the **quadratic formula** to find the solutions. Round the answers to three **decimal places**.

48. $r^2 - 3r + 5 = 6$ Type: _____

48. r = { _____ }

49. $3m^2 + 10m + 3 = 11$ Type: _____

49. m = { _____ }

50. $5k^2 - 2k + 4 = 3$ Type: _____

50. k = { _____ }

51. $y^2 + 3y - 23 = 5$ Type: _____

51. y = { _____ }

52. $4z^2 + 6z - 5 = 2$ Type: _____

52. y = { _____ }

Lesson: Midpoint Formula (In Class Lesson)

53. A(– 4 , 2) B(9, 10) Find midpoint of $\overline{AB}$.

54. C(–4 , – 3) D(6, – 3) Find midpoint of $\overline{CD}$.

55. X(6 , 15) Y(4, –7) Find midpoint of $\overline{XY}$.

Lesson: Partitions (In Class Lesson)

56. E(–3 , 5) G(2, 7) Find F (interior point) such that EF:FG is 4:3.

57. J(–1 , – 4) L(3, – 9) Find K (interior point) such that JK:JL is 2:9.

58. W(2 , 1) X(5, –7) Find Y (exterior point) such that WX:XY is 1:4.

Completing the Square Videos (Part K)

Exact answers meaning no decimals.

59. $x^2 - 6x + 13 = 0$

Type: _____

59. y = { _____ }

60. $t^2 - 2t - 15 = 0$

Type: _____

60. y = { _____ }

61. $r^2 - 2r - 17 = 6r - 4$

Type: _____

61. y = { _____ }

62. $3g^2 + 2g - 8 = 0$

Type: _____

62. y = { _____ }