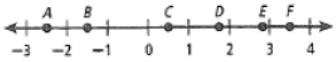
Solving Radicals

1. Which of the following is an irrational number?

A $\sqrt{3}$
B $0.\overline{714285}$
C $\frac{3}{4}$
D all of the above

2. Which point on the number line best represents $\sqrt{8}$?

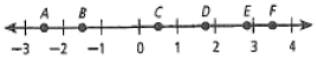


A Point *C*
B Point *D*
C Point *E*
D Point *F*

3. Which number is between Point *X* and Point *Y* on the number line?

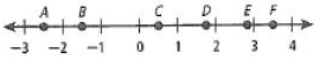
A $\sqrt{30}$
B $\sqrt{63}$
C $\sqrt{64}$
D $\sqrt{81}$

4. Which point on the number line best represents $\sqrt{12}$?



A Point *A*
B Point *B*
C Point *D*
D Point *F*

5. Which point on the number line best represents $-\sqrt{6}$?



A Point *A*
B Point *B*
C Point *C*
D Point *D*

6. $\sqrt{3}$ lies between which two consecutive integers?

A 1 and 2
B 2 and 3
C 3 and 4
D none of the above

7. $\sqrt{30}$ is between which 2 consecutive integers?

A 4 and 5
B 5 and 6
C 5 and 7
D 6 and 7

8. Which square root is between 4 and 6?

A $\sqrt{12}$
B $\sqrt{16}$
C $\sqrt{21}$
D $\sqrt{40}$

9. Angie's math teacher asked her to name an irrational number close to 5. Which of these numbers would be best for her to name?

A $\sqrt{10}$
B $\sqrt{21}$
C $\sqrt{35}$
D $\sqrt{55}$

10. Jorge's math teacher asked him to name an irrational number close to 8. Which of these numbers would be the best for him to name?

A $\sqrt{16}$
B $\sqrt{51}$
C $\sqrt{62}$
D $\sqrt{88}$

11. What are the square roots of 64?

A. −8 only
B. 8 and −8
C. 8 only
D. −64 and 64

12. A square court for playing the game four-square has an area of 256 square feet. How long is one side of the court?

A 4 feet
B 16 feet
C 25 feet
D 36 feet

13. The area of a square field is 200 ft^2. Estimate the length of each side of the field.

A 10 feet
B 14 feet
C 20 feet
D 28.5 feet

14. Which is the best estimate of the length of each side of the square?

$A = 76\ cm^2$

A 9 centimeters
B 10 centimeters
C 19 centimeters
D 38 centimeters

15. Which is NOT a perfect square?

A 16
B 49
C 150
D 576

16. Simplify $\sqrt{45}$.

A $3\sqrt{5}$
B $5\sqrt{3}$
C $5\sqrt{9}$
D $9\sqrt{5}$

17. Simplify $\sqrt{800}$.

A $2\sqrt{200}$
B $4\sqrt{50}$
C $20\sqrt{2}$
D $400\sqrt{2}$

18. Add $10\sqrt{2n} + 5\sqrt{2n}$.

F $\sqrt{30n}$
G $15\sqrt{2n}$
H $30\sqrt{n}$
J $30n$

19. Subtract $6\sqrt{5n} - 2\sqrt{5n}$.

A $2\sqrt{5n}$
B 4
C $4\sqrt{5n}$
D $4\sqrt{10n}$

20. Simplify $3\sqrt{20} + 2\sqrt{45}$.

F $12\sqrt{5}$
G $45\sqrt{5}$
H $5\sqrt{65}$
J $36\sqrt{5}$

21. Simplify.

$$2\sqrt{24} + \sqrt{6} - \sqrt{54}$$

A 0
B $2\sqrt{6}$
C $\sqrt{48}$
D cannot be simplified

22. Subtract $5\sqrt{12b} - 3\sqrt{3b}$.

A cannot combine
B $\sqrt{51b}$
C $6\sqrt{b}$
D $7\sqrt{3b}$

23. Simplify $\sqrt{40x} + \sqrt{25x} - \sqrt{10x}$.

F $6\sqrt{11x}$
G $2\sqrt{10x} + 5\sqrt{x}$
H $5\sqrt{x} + \sqrt{10x}$
J $5\sqrt{x} - \sqrt{10x}$

24. Simplify $\sqrt{50x^3}$. The variable represents a nonnegative number.

A $x\sqrt{50x}$
B $5\sqrt{2x^3}$
C $5x\sqrt{2x}$
D $25x^2\sqrt{2x}$

25. Simplify $\sqrt{18a^2b^3}$.

A $3ab\sqrt{2b}$
B $3ab\sqrt{2ab^2}$
C $3ab\sqrt{6b}$
D $9ab\sqrt{2b}$

26. Simplify. $\sqrt{15} \cdot \sqrt{6}$

A. $9\sqrt{10}$
B. $6\sqrt{15}$
C. $3\sqrt{10}$
D. $15\sqrt{6}$

27. Multiply $\sqrt{26}\sqrt{2}$ and write in simplest form.

A $\sqrt{52}$
B $2\sqrt{13}$
C $4\sqrt{13}$
D $13\sqrt{4}$

28. Multiply $\sqrt{2}\ (\sqrt{14} + \sqrt{10})$ product in simplest form.

A $4\sqrt{3}$
B $2\sqrt{7} + 2\sqrt{5}$

29. Which shows $\sqrt{3}(8 + \sqrt{15})$ in simplest form?

A $8\sqrt{3} + \sqrt{45}$
B $8\sqrt{3} + 3\sqrt{5}$
C $8\sqrt{3} + 9\sqrt{5}$
D $11\sqrt{8}$

30. Simplify $\sqrt{\frac{90}{49}}$.

F $\frac{2\sqrt{45}}{7}$
G $\frac{3\sqrt{30}}{7}$
H $\frac{9\sqrt{10}}{7}$
J $\frac{3\sqrt{10}}{7}$

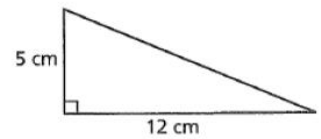
31. Simplify the quotient $\frac{\sqrt{15}}{\sqrt{2}}$.

A $\frac{\sqrt{15}}{2}$
B $\frac{\sqrt{30}}{2}$

32. Simplify the quotient $\frac{\sqrt{8}}{\sqrt{3}}$.

A $\frac{2\sqrt{2}}{\sqrt{3}}$
B $\frac{2\sqrt{2}}{3}$
C $\frac{2\sqrt{6}}{3}$
D $\frac{6\sqrt{2}}{3}$

33. How long is the hypotenuse of this right triangle?

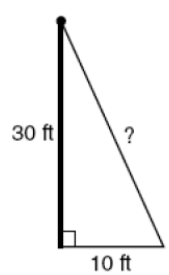


A 13 cm
B 15 cm
C 18 cm
D 20 cm

34. The number $\sqrt{53}$ is the length of the hypotenuse of a triangle with side length 2 and what other side length?

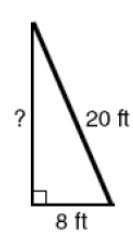
A 7
B 8
C 9
D 10

35. A 30-foot pole is stabilized by a wire attached to the ground 10 feet from the base of the pole. How long is the wire? Give your answer as a radical expression in simplest form.



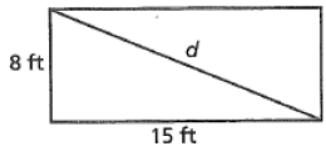
F $2\sqrt{5}$ ft
G $2\sqrt{10}$ ft
H $10\sqrt{10}$ ft
J $20\sqrt{2}$ ft

36. A 20-foot ladder leans against a wall with its base 8 feet from the wall. How high up on the wall does the ladder reach? Give your answer as a radical expression in simplest form.



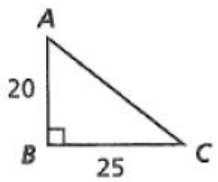
F $2\sqrt{3}$ ft
G $2\sqrt{7}$ ft
H $4\sqrt{21}$ ft
J $4\sqrt{29}$ ft

37. The gate of a fence is 8 ft tall and 15 ft wide. How long is the diagonal strip *d* used to brace this gate?



A 15.5 ft
B 17 ft
C 20 ft
D 23 ft

38. Which expression equals *AC*?

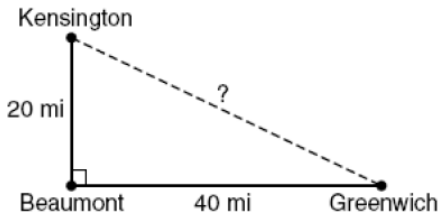


A $\sqrt{500}$
B $\sqrt{1,025}$
C $\sqrt{2,000}$
D $\sqrt{2,025}$

39. Linda has 120 meters of fencing to enclose a garden. Which of these side lengths will make a garden with the shape of a right triangle?

A 10 m, 50 m, 60 m
B 20 m, 50 m, 50 m
C 30 m, 40 m, 50 m
D 40 m, 40 m, 40 m

40.



Which is the distance between Kensington and Greenwich?

A $20\sqrt{3}$ mi
B $20\sqrt{5}$ mi