

Section 12-1: Radicals and the Rational Numbers

Perfect Squares

1. 060706a

The expression $\sqrt{54-b}$ is equivalent to a positive integer when b is equal to

- [A] 4 [B] 16 [C] 54 [D] -10

Section 12-2: Radicals and the Irrational Numbers

Basic Rules for Radicals That Are Irrational Numbers

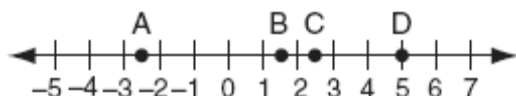
2. 010001a, P.I. 7.N.18

The expression $\sqrt{93}$ is a number between

- [A] 3 and 9 [B] 46 and 47
[C] 9 and 10 [D] 8 and 9

3. 010703a, P.I. 7.N.18

Which point on the accompanying number line best represents the position of $\sqrt{5}$?



- [A] A [B] D [C] C [D] B

4. 060003a, P.I. 7.N.2

Which number is rational?

- [A] $\frac{5}{4}$ [B] π [C] $\sqrt{7}$ [D] $\sqrt{\frac{3}{2}}$

5. 080102a, P.I. 7.N.2

Which expression is rational?

- [A] $\sqrt{3}$ [B] $\sqrt{\frac{1}{4}}$ [C] $\sqrt{\frac{1}{2}}$ [D] π

6. 069923a, P.I. 7.N.2

Which number below is irrational?

$$\sqrt{\frac{4}{9}}, \sqrt{20}, \sqrt{121}$$

Why is the number you chose an irrational number?

7. 060502a

The amount of time, t , in seconds, it takes an object to fall a distance, d , in meters, is

expressed by the formula $t = \sqrt{\frac{d}{4.9}}$.

Approximately how long will it take an object to fall 75 meters?

- [A] 0.26 sec [B] 3.9 sec
[C] 2.34 sec [D] 7.7 sec

Section 12-4: Simplifying a Square-Root Radical

8. 089902a, P.I. A.N.2

The expression $\sqrt{50}$ can be simplified to

- [A] $2\sqrt{25}$ [B] $5\sqrt{10}$
[C] $5\sqrt{2}$ [D] $25\sqrt{2}$

9. 010530a, P.I. A.N.2

When $\sqrt{72}$ is expressed in simplest $a\sqrt{b}$ form, what is the value of a ?

- [A] 8 [B] 6 [C] 3 [D] 2

10. fall0731a, P.I. A.N.2

Express $5\sqrt{72}$ in simplest radical form.

11. 080125a, P.I. A2.A.13

Simplify: $\sqrt{50r^2s^4}$

12. 010422a, P.I. A2.A.13

If $a > 0$, then $\sqrt{9a^2 + 16a^2}$ equals

- [A] $5\sqrt{a}$ [B] $5a$ [C] $\sqrt{7a}$ [D] $7a$

Section 12-5: Addition and Subtraction of Radicals

13. 010311a, P.I. A.N.3

The sum of $\sqrt{75}$ and $\sqrt{3}$ is

- [A] 18 [B] $\sqrt{78}$ [C] $6\sqrt{3}$ [D] 15

14. 080524a, P.I. A.N.3

What is the sum of $5\sqrt{7}$ and $3\sqrt{28}$?

- [A] $11\sqrt{7}$ [B] $8\sqrt{35}$
[C] $60\sqrt{7}$ [D] $9\sqrt{7}$

15. 060316a, P.I. A.N.3

The sum of $\sqrt{18}$ and $\sqrt{72}$ is

- [A] $6\sqrt{3}$ [B] $3\sqrt{10}$
[C] $9\sqrt{2}$ [D] $\sqrt{90}$

16. 080614a, P.I. A.N.3

What is the sum of $\sqrt{50}$ and $\sqrt{32}$?

- [A] $\sqrt{82}$ [B] $9\sqrt{2}$
[C] $\sqrt{2}$ [D] $20\sqrt{20}$

17. 080712a, P.I. A.N.3

What is the sum of $\sqrt{50}$ and $\sqrt{8}$?

- [A] $29\sqrt{2}$ [B] $7\sqrt{2}$
[C] $9\sqrt{2}$ [D] $\sqrt{58}$

18. 069920a, P.I. A.N.3

The expression $\sqrt{27} + \sqrt{12}$ is equivalent to

- [A] $13\sqrt{3}$ [B] $5\sqrt{3}$
[C] $5\sqrt{6}$ [D] $\sqrt{39}$

19. 060512a, P.I. A.N.3

The expression $\sqrt{50} + \sqrt{32}$ is equivalent to

- [A] 18 [B] $\sqrt{82}$ [C] 6 [D] $9\sqrt{2}$

20. 060724a, P.I. A.N.3

The expression $\sqrt{28} + \sqrt{63}$ is equivalent to

- [A] $5\sqrt{7}$ [B] $6\sqrt{7}$
[C] $\sqrt{91}$ [D] $13\sqrt{7}$

21. 010826a, P.I. A.N.3

The expression $\sqrt{28} - \sqrt{7}$ is equivalent to

- [A] $3\sqrt{7}$ [B] 4 [C] $\sqrt{7}$ [D] 2

22. 080016a, P.I. A.N.3

The expression $2\sqrt{50} - \sqrt{2}$ is equivalent to

- [A] 10 [B] $9\sqrt{2}$
[C] $49\sqrt{2}$ [D] $2\sqrt{48}$

Section 12-6: Multiplication of Square-Root Radicals

23. 060627a, P.I. A.N.3

Expressed in simplest radical form, the product of $\sqrt{6} \cdot \sqrt{15}$ is

- [A] $3\sqrt{15}$ [B] $\sqrt{90}$
[C] $3\sqrt{10}$ [D] $9\sqrt{10}$

24. 010103a, P.I. A2.A.13

If $x > 0$, the expression $(\sqrt{x})(\sqrt{2x})$ is equivalent to

- [A] $x\sqrt{2}$ [B] $x^2\sqrt{2}$
[C] $\sqrt{2x}$ [D] $2x$

25. 060218a, P.I. A.N.3

The expression $\sqrt{90} \cdot \sqrt{40} - \sqrt{8} \cdot \sqrt{18}$ simplifies to

- [A] 22.9 [B] 3,456 [C] 864 [D] 48

Section 12-7: Division of Square-Root Radicals

26. 010622a, P.I. A.N.3

The expression $\frac{6\sqrt{20}}{3\sqrt{5}}$ is equivalent to

- [A] $3\sqrt{15}$ [B] 8 [C] $2\sqrt{15}$ [D] 4

[1] D

[2] C

[3] C

[4] A

[5] B

[2] $\sqrt{20}$ and an appropriate explanation is given, such as the number cannot be written as a repeating or terminating decimal or it cannot be written as a fraction or it is not a perfect square.

[1] $\sqrt{20}$ and an inappropriate explanation or no explanation is given.

or [1] $\sqrt{20}$ and a correct explanation is given, but one other number is also identified as irrational.

[0] All three numbers are identified as irrational.

or [0] A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an obviously incorrect procedure.

[6] _____

[7] B

[8] C

[9] B

[2] $30\sqrt{2}$, and appropriate work is shown.

[1] Appropriate work is shown, but one computational error is made.

or [1] Appropriate work is shown, but one conceptual error is made.

or [1] Appropriate work is shown, but the answer is not in simplest radical form.

or [1] $30\sqrt{2}$, but no work is shown.

[0] A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an obviously

[10] incorrect procedure.

[2] $5rs^2\sqrt{2}$, and appropriate work is shown.

[1] A partially correct answer is found, such as $5r\sqrt{2s^4}$ or $5s^2\sqrt{2r^2}$, and appropriate work is shown.

or [1] $7.07rs^2$, but appropriate work is shown.

or [1] $5rs^2\sqrt{2}$, but no work is shown.

[0] A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an obviously

[11] incorrect procedure.

[12] B

[13] C

[14] A

[15] C

[16] B

[17] B

[18] B

[19] D

[20] A

[21] C

[22] B

[23] C

[24] A

[25] D

[26] D