

Extension P. 577: Rational Exponents

1. 010217b, P.I. A2.N.1

The value of $\left(\frac{3^0}{2^{\frac{1}{2}}}\right)^{-1}$ is

- [A] $\frac{1}{9}$ [B] -9 [C] 9 [D] $-\frac{1}{9}$

2. 080601b, P.I. A2.N.1

The expression $4^{\frac{1}{2}} \cdot 2^3$ is equal to

- [A] $8^{\frac{3}{2}}$ [B] $4^{\frac{3}{2}}$ [C] 16 [D] 4

3. 080218b, P.I. A2.N.1

The expression $\frac{3^{\frac{1}{3}}}{3^{-\frac{2}{3}}}$ is equivalent to

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

4. 060208b, P.I. A2.A.10

If x is a positive integer, $4x^{\frac{1}{2}}$ is equivalent to

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

5. 010413b, P.I. A2.A.10

The expression $b^{-\frac{3}{2}}$, $b > 0$, is equivalent to

- [A] $(\sqrt[3]{b})^2$ [B] $\frac{1}{(\sqrt[3]{b})^2}$
[C] $\frac{1}{(\sqrt{b})^3}$ [D] $-(\sqrt{b})^3$

6. 060708b, P.I. A2.A.11

The volume of a soap bubble is represented by the equation $V = 0.094\sqrt{A^3}$, where A represents the surface area of the bubble. Which expression is also equivalent to V ?

- [A] $0.094A^6$ [B] $0.094A^{\frac{2}{3}}$
[C] $(0.094A^3)^{\frac{1}{2}}$ [D] $0.094A^{\frac{3}{2}}$

7. 060419b, P.I. A2.A.11

The expression $\sqrt[4]{16a^6b^4}$ is equivalent to

- [A] $4a^2b$ [B] $2a^{\frac{3}{2}}b$
[C] $2a^2b$ [D] $4a^{\frac{3}{2}}b$

8. 010617b, P.I. A2.A.8

When simplified, the expression $(\sqrt[3]{m^4})(m^{-\frac{1}{2}})$ is equivalent to

- [A] $\sqrt[3]{m^{-2}}$ [B] $\sqrt[4]{m^3}$
[C] $\sqrt[6]{m^5}$ [D] $\sqrt[5]{m^{-4}}$

9. 080322b, P.I. A2.N.1

Find the value of $(x+2)^0 + (x+1)^{-\frac{2}{3}}$ when $x = 7$.

10. 060602b, P.I. A2.A.8

If $f(x) = x^{-\frac{3}{2}}$, then $f(\frac{1}{4})$ is equal to

- [A] $-\frac{1}{8}$ [B] 8 [C] -2 [D] -4

11. 060516b

If $(a^x)^{\frac{2}{3}} = \frac{1}{a^2}$, what is the value of x ?

- [A] -1 [B] -3 [C] 2 [D] 1

12. 080325b

Meteorologists can determine how long a storm lasts by using the function

$t(d) = 0.07d^{\frac{3}{2}}$, where d is the diameter of the storm, in miles, and t is the time, in hours. If the storm lasts 4.75 hours, find its diameter, to the nearest tenth of a mile.

[1] C _____

[2] C _____

[3] C _____

[4] A _____

[5] C _____

[6] D _____

[7] B _____

[8] C _____

[2] $1\frac{1}{4}$ or an equivalent answer, 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] $1\frac{1}{4}$ or an equivalent answer, 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

[9] incorrect procedure. _____

[10] B _____

[11] B _____

[2] 16.6, and appropriate work is shown.

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

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

or [1] A correct substitution of 4.75 for t is made, but no further correct work is shown.

or [1] 16.6, 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

[12] incorrect procedure. _____