A2.A.22: Solve radical equations

1. 010607b, P.I. A2.A.22
If $\sqrt{2x-1}+2=5,$ then x is equal to
[A] 2 [B] 4 [C] 5 [D] 1

2. 080602b, P.I. A2.A.22
What is the solution of the equation $\sqrt{2x-3}-3=6$?
[A] 39 [B] 42 [C] 6 [D] 3

3. 010802b, P.I. A2.A.22
What is the value of x in the equation $\sqrt{3+x}-5=-2$?
[A] 3 [B] 6 [C] 12 [D] 46

4. 010921b, P.I. A2.A.22
Solve for x: $\sqrt{x+18}-2=2$

5. 080104b, P.I. A2.A.22
The solution set of the equation $\sqrt{x+6}=x$ is
[A] { } [B] {3} [C] {-2} [D] {-2,3}

6. 010305b, P.I. A2.A.22
What is the solution set of the equation $\sqrt{9x+10}=x$
[A] {10, -1} [B] {-1}
[C] {9} [D] {10}

7. 060214b, P.I. A2.A.22
What is the solution set of the equation $x=2\sqrt{2x-3}$?
[A] {2,6} [B] {2} [C] { } [D] {6}

8. 060528b, P.I. A2.A.22
Solve for all values of q that satisfy the equation $\sqrt{3q+7}=q+3.$

9. 010427b, P.I. A2.A.22
Solve algebraically: $\sqrt{x+5}+1=x$

10. 060629b, P.I. A2.A.22
Solve algebraically for x: $\sqrt{3x+1}+1=x$

11. 060915b, P.I. A2.A.22
What is the solution set of the equation $y=2+\sqrt{y^2-12}$?
[A] {4} [B] {-4,4} [C] { } [D] {2}

12. 080302b, P.I. A2.A.22
What is the value of x in the equation $\sqrt{5-2x}=3i$?
[A] -2 [B] 1 [C] 7 [D] 4

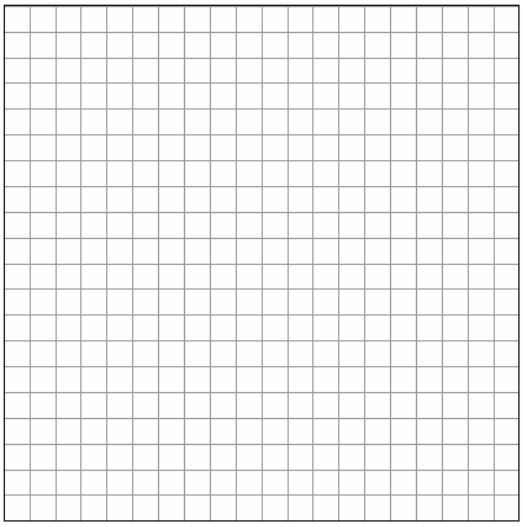
13. 080821b, P.I. A2.A.22
The number of dogs, D, housed at a county animal shelter is modeled by the function $D=4\sqrt{2M}+50,$ where M is the number of months the shelter has been open. How many months will it take for 74 dogs to be housed at the shelter?

14. 010323b, P.I. A2.A.22
A wrecking ball suspended from a chain is a type of pendulum. The relationship between the rate of speed of the ball, R, the mass of the ball, m, the length of the chain, L, and the force, F, is $R=2\pi\sqrt{\frac{mL}{F}}$. Determine the force, F, to the *nearest hundredth*, when L = 12, m = 50, and R = 0.6.

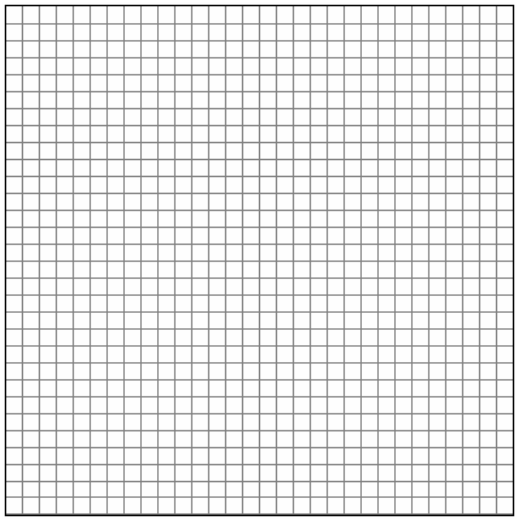
15. fall9923b, P.I. A2.A.22
The period of a pendulum (T), in seconds, is the length of time it takes for the pendulum to make one complete swing back and forth. The formula $T=2\pi\sqrt{\frac{L}{32}}$ gives the period T for a pendulum of length L in feet. If you want to build a grandfather clock with a pendulum that swings back and forth once every 3 seconds, how long, to the *nearest tenth of a foot*, would you make the pendulum?

16. 080528b, P.I. A2.A.22
The lateral surface area of a right circular cone, *s*, is represented by the equation $s = \pi r\sqrt{r^2 + h^2}$, where *r* is the radius of the circular base and *h* is the height of the cone. If the lateral surface area of a large funnel is 236.64 square centimeters and its radius is 4.75 centimeters, find its height, to the *nearest hundredth of a centimeter.*

17. 060426b, P.I. A2.A.22
The equation $V = 20\sqrt{C + 273}$ relates speed of sound, *V*, in meters per second, to air temperature, *C*, in degrees Celsius. What is the temperature, in degrees Celsius, when the speed of sound is 320 meters per second? [The use of the accompanying grid is optional.]



18. 010532b, P.I. A2.A.22
The number of people, *y*, involved in recycling in a community is modeled by the function $y = 90\sqrt{3x} + 400$, where *x* is the number of months the recycling plant has been open. Construct a table of values, sketch the function on the grid, and find the number of people involved in recycling exactly 3 months after the plant opened. After how many months will 940 people be involved in recycling?



A2.A.22: Solve radical equations

[1] C

[2] B

[3] B

[2] -2, and appropriate work is shown, such as solving the equation algebraically, graphically or using trial and error with at least three trials and appropriate checks.
[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] The trial-and-error method is attempted and at least six systematic trials and appropriate checks are shown, but no solution is found.
or [1] -2, but no work or fewer than three trials and appropriate checks are shown.
[0] A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an obviously incorrect procedure.
[4]

[5] B

[6] D

[7] A

[4] –2 and –1, and appropriate work is shown.
[3] Appropriate work is shown, but one computational error is made.
or [3] Appropriate work is shown, but only one value of q is found.
[2] Appropriate work is shown, but two or more computational errors are made.
or [2] Appropriate work is shown, but one conceptual error is made, such as squaring only the left side of the equation.
[1] Appropriate work is shown, but one conceptual error and one computational error are made.
or [1] –2 and –1, but no work is shown.
[0] –2 or –1, but no work is shown.
or [0] A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an obviously incorrect procedure.
[8]

[4] 4, and appropriate work is shown.
[3] Appropriate work is shown, but one computational error is made.
or [3] Appropriate work is shown, but $x = -1$ is not rejected.
[2] Appropriate work is shown, but two or more computational errors are made.
or [2] Appropriate work is shown, but one conceptual error is made.
or [2] The correct quadratic equation is written in standard form, but no further correct work is shown.
or [2] A quadratic equation of equal difficulty is solved appropriately.
[1] Both sides of the equation are squared correctly, but no further correct work is shown.
or [1] 4, 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 incorrect procedure.
[9]

[4] 5, and appropriate algebraic work is shown.
[3] Appropriate work is shown, but one computational error is made.
or [3] 5 and 0, and appropriate work is shown, but the zero is not rejected.
[2] Appropriate work is shown, but two or more computational errors are made.
or [2] Appropriate work is shown, but one conceptual error is made, such as squaring $x-1$ incorrectly.
or [2] 5, but a method other than an algebraic solution is used, such as graphing or trial and error with at least three trials and appropriate checks.
or [2] A correct quadratic equation is written in standard form, such as $0=x^2-5x,$ but no further correct work is shown.
or [2] An incorrect quadratic equation of equal difficulty is solved appropriately.
[1] Appropriate work is shown, but one conceptual error and one computational error are made.
or [1] An incorrect equation of a lesser degree of difficulty is solved appropriately.
or [1] 5, but no work is shown.
[0] 5 and 0, and no work is shown.
or [0] A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an
[10] obviously incorrect procedure.

[11] A

[12] C

[2] 18, and appropriate work is shown, such as an algebraic or a graphic solution or trial and error with at least three trials and appropriate checks.
[1] Appropriate work is shown, but one computational or graphing error is made.
or [1] Appropriate work is shown, but one conceptual error is made.
or [1] The trial-and-error method is used and at least six systematic trials and appropriate checks are shown, but no solution is found.
[1] 18, but no work or fewer than three trials with appropriate checks are shown.
[0] A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an obviously
[13] incorrect procedure.

[2] 65,797.36, and appropriate work is shown.
[1] Appropriate work is shown, but one computational or rounding error is made.
or [1] An incorrect derivation of the equation is solved appropriately.
or [1] 65,797.36, 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
[14] incorrect procedure.

[2] Answer of 7.3, with appropriate substitution shown.
[1] Answer given, but not rounded correctly.
or [1] Correct answer only, no work shown.
or [1] Shows correct substitution, but answer is incorrect.
or [1] Log equation, no substitution of values.
[0] A zero response is completely incorrect, irrelevant, or incoherent; or is a correct response that was obtained by an obviously incorrect procedure.
[15] or [0] Substitutes 3 for *L*.

[4] 15.13, and appropriate work is shown, such as solving the equation $236.64 = \pi(4.75)\sqrt{(4.75)^2 + h^2}$.
[3] Appropriate work is shown, but one computational or rounding error is made.
[2] Appropriate work is shown, but two or more computational or rounding errors are made.
or [2] Appropriate work is shown, but one conceptual error is made.
[1] Appropriate work is shown, but one conceptual error and one computational or rounding error are made.
or [1] Correct substitution of values is made into the equation, but no further correct work is shown.
or [1] 15.13, 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 incorrect procedure.

[16]

[2] –17, and appropriate work is shown.
[1] Appropriate work is shown, but one conceptual error or one computational or graphing error is made.
or [1] –17, 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 incorrect procedure.

[17]

[4] A correct table of values is provided, a correct graph is drawn, and 670; 12, and appropriate work is shown, such as extending the graph or solving algebraically.
[3] Appropriate work is shown, but one computational or graphing error is made.
or [3] A correct table of values is provided, a correct graph is drawn, and 670, but no further correct work is shown.
[2] Appropriate work is shown, but two or more computational or graphing errors are made.
or [2] Appropriate work is shown, but one conceptual error is made.
or [2] 670 and 12, but an algebraic solution is provided.
or [2] 670 and 12, but either the graph is not drawn or the table of values is not provided.
[1] Appropriate work is shown, but one conceptual error and one computational or graphing error are made.
or [1] A correct graph is drawn, but no further correct work is shown.
or [1] A correct table of values is provided, but no further correct work is shown.
or [1] 670 and 12, but no work is shown and no graph is drawn.
[0] 670 or 12, but no work is shown and no graph is drawn.
or [0] A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an obviously incorrect procedure.

[18]