

Answer Key for AWS Certified Welding Engineer Examination Sample Questions – Parts 1 and 2

Part 1 Basic Fundamentals of Science Examination

Mathematics

1. c.

Explanation for solving #1

$\tan \theta = O/A$ and that $\cot \theta = A/O$, using a calculator $\tan 63 = 1.96 = \cot \theta$ therefore $\theta = 27$ if you need to work it out you could say
 $1.96 = \cot \theta$
 $1.96 = 1/\tan \theta$
 $\tan \theta = 1/1.96$
 $\tan \theta = .51$
 $\theta = 27$

2. a.

3. b.

4. c.

5. a.

6. c.

7. c.

Explanation for solving #7

If $x^2 + y^2 = 2$, and $xy = -1$, then $x^3 + y^3 = ?$

First use $xy = -1$ and solve for y

$$y = -1/x$$

Substitute for y into $x^2 + y^2 = 2$

$$x^2 + (-1/x)^2 = 2$$

$$x^4 - 2x^2 + 1 = 0$$

There are several ways to solve for x from here.

You can break it down into $(x^2-1)(x^2-1) = 0$

The solution set $x^2 = 1$ is $\{\sqrt{1}$ or $-\sqrt{1}\}$

Using $x = 1$ and plugging into $xy = -1$ and solving for y, $y = -1$

Hence $x^3 + y^3 = ?$

$$1^3 + (-1)^3 = 0$$

The correct answer is C, 0

There are several other ways to solve this as you could also use the Quadratic Formula and you will still end up getting an answer of 0

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

8. d.

Explanation for solving #8

$$Z = (X_o - u) / \text{Sigma} = (72 - 66) / 5 = 1.2$$

From the Z Distribution Chart a value of Z = 1.2 yields a factor of 0.3849

Therefore, the % exceeding 72 = $0.5 - 0.3849 = 0.1151 = 11.5\%$.

Physics

9. d.

10. a.

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Chemistry

- 11. c.
- 12. d.
- 13. b.

Part 2, Applied Fundamentals of Science Examination

Strength of Materials

- 14. d.

Explanation for solving #14

Axial Strain = (Length)(Force) / (Area)(E) = (1 M) (250 kN) / (2500 square millimeters)(200 Giga-Pascal's) = 0.005 millimeters

Poisson's Ratio = ν = Lateral Strain/Axial Strain = 0.3

Therefore: Lateral Strain = (0.3)(Axial Strain) = 0.3 x 0.005 millimeters = 1.5 x 10⁻⁴ millimeters.

- 15. d
- 16. n/a
- 17. a.

No sample problems provided for Parts 3 and 4.