Secondary III 5-3 HW

Name: Selected Answers

Radical Equations

Solve the equation.

1. $\sqrt{x-9}=5$

2. $\sqrt{3x}^2 = 6^2$

$3x = 36$

$x = 12$

Check:

$\sqrt{3(12)} = 6$

$\sqrt{36} = 6$

$6 = 6$ ✓

3. $\sqrt{x+3}^2 = (x+1)^2$ $(x+1)$

$x+3 = x^2+2x+1$

$-x \quad -x$

$3 = x^2+x+1$

$-3 \quad -3$

$0 = (x^2+x-2)$

$0 = (x+2)(x-1)$

$x = -2, 1$

$x = 1$

Check:

$\sqrt{-2+3} = -2+1$

$\sqrt{1} = -1$

$1 = -1$ ×

$\sqrt{1+3} = 1+1$

$\sqrt{4}^2 = 2^2$ ✓

4. $\sqrt{(15x+10)} = 2x+3$

5. $(x+4)^{\frac{1}{2}} = 6$

7. $((x-6)^{\frac{1}{2}})^2 = (x-2)^2$

$x-6 = x^2-4x+4$

$-x+6 \quad -x \quad +6$

$0 = x^2-5x+10$

$x = \frac{5 \pm \sqrt{25-4(1)(10)}}{2(1)} =$

$x = \frac{5 \pm \sqrt{25-40}}{2}$

$x = \frac{5 \pm \sqrt{15}i}{2}$

No solution

9. $5 - \sqrt[3]{x-4} = 2$

$-5 \quad -5$

$-\sqrt[3]{x-4} = -3$

$\frac{-\sqrt[3]{x-4}}{-1} = \frac{-3}{-1}$

$\sqrt[3]{x-4}^3 = 3^3$

$x-4 = 27$

$+4 \quad +4$

$x = 31$

Check:

$5 - \sqrt[3]{31-4} = 2$

$5 - \sqrt[3]{27} = 2$

$5 - 3 = 2$

$5-3 = 2$

$2 = 2$ ✓

10. $2\sqrt[3]{3x+2} = \sqrt[3]{4x-9}$

13. $(x+7)^{\frac{1}{3}} = (4x)^{\frac{1}{3}}$

14. $((5x+1)^{\frac{1}{4}})^4 = 4^4$

$5x+1 = 256$

$-1 \quad -1$

$\frac{5x}{5} = \frac{255}{5}$

$x = 51$

Check:

$(5(51)+1)^{1/4} = 4$

$(255+1)^{1/4} = 4$

$(256)^{1/4} = 4$

$4 = 4$ ✓

16. $2(x-1)^{\frac{1}{5}} = (2x-17)^{\frac{1}{5}}$

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18. Anatomy The surface area S of a human body in square meters can be approximated by $S = \sqrt{\frac{hm}{36}}$ where h is height in meters and m is mass in kilograms. A basketball player with a height of 2.1 meters has a surface area of about 2.7 m^2. What is the player's mass?

h S m

20. Amusement Parks For a spinning amusement park ride, the velocity v in meters per second of a car moving around a curve with radius r meters is given by $v = \sqrt{ar}$ where a is the car's acceleration in m/s^2. If the ride has a maximum acceleration of 30 m/s^2 and the cars on the ride have a maximum velocity of 12 m/s, what is the smallest radius that any curve on the ride may have?

$12^2 = \sqrt{30(r)}^2$

$\frac{144}{30} = \frac{30r}{30}$

$r = 4.8$ m

23. Explain the Error Below is a student's work in solving the equation $2\sqrt{3x+3} = 12$. What mistake did the student make? What is the correct solution?

$2\sqrt{3x+3} = 12$

$2\left(\sqrt{3x+3}\right)^2 = 12^2$

$2(3x+3) = 144$

$6x + 6 = 144$

$x = 23$

Review

1. Given the zero x= -3i, find the remaining zeros of $h(x) = 3x^4 + 5x^3 + 25x^2 + 45x - 18$

2. Given the zeros, x= 1+2i and x= -2, write a function in factored form.