III. Solving Radical Equations

9. Solve: $\sqrt{m-4}=1$

A) -25 B) -3

C) 5 D) 8

E) no solution

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10. What is the solution to the equation $\sqrt{x-19}-3=6$?

A) 100 B) 121 C) 144 D) 169 E) 196

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11. Solve: $\sqrt{5y-5}=\sqrt{4y+1}$

A) -6 or -2 B) -3 or 1 C) -2 or 4

D) 4 E) 6

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12. Solve: $\sqrt{t-3}=-2$

A) -5 B) -1

C) 0 D) 7

E) no solution

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13. Solve: $\sqrt{5x+11}=x+3$

A) -4 or -8 B) -2 or -6 C) 1 or -2

D) 2 or 6 E) 1 or 8

14. Solve: $\sqrt{21+x}=3+\sqrt{x}$

A) 4 B) 8 C) 10 D) 14 E) 18

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15. The distance, d kilometres, to the horizon, seen from a height of h metres, is given by the relationship $d=8\sqrt{\frac{h}{5}}$. From one of our local mountains an observer notices that she can see an island on the horizon 160 km away. How high up the mountain is our observer?

A) 1600 m B) 2000 m C) 2100 m

D) 2500 m E) 4000 m

IV. Solving Rational Equations

16. Solve the equation $\frac{2p+7}{3}=\frac{p-1}{4}$.

A) -12 B) $-\frac{17}{2}$ C) $-\frac{31}{5}$

D) -3 E) $\frac{7}{2}$

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17. Solve: $\frac{x+1}{8}=\frac{9}{24}$

A) 2 B) 3 C) $2\frac{23}{24}$

D) $10\frac{1}{3}$ E) $13\frac{9}{10}$

18. Solve: $\frac{4}{y} + \frac{2}{3} = 1$

A) $-\frac{5}{3}$ B) $\frac{3}{2}$ C) 5 D) 12 E) $\frac{25}{2}$

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19. Solve the equation $\frac{1}{x-1} + \frac{1}{2} = \frac{2}{(x-1)(x+1)}$.

A) -5 B) -3 C) -5 or 2

D) -3 or 1 E) 0 or 1

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20. Solve: $\frac{5}{x+1} + \frac{2}{x-2} = 2$

A) $-\frac{1}{2}$ and -4 B) $\frac{1}{2}$ and 4

C) -1 and -4 D) 1 and 4

E) 2 and 4

V. Types of Variations

21. What kind of variation does the equation $K = \frac{4}{m^2}$ describe?

A) direct B) inverse C) joint

D) compound E) disjoint

22. What kind of variation does the equation $K = \frac{3mv^2}{t}$ describe?

A) direct B) inverse C) joint

D) compound E) disjoint

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23. The cost of pencils varies directly as the number of *gross* purchased. If 4 gross cost \$10.68, then how much will 9 gross of pens cost?

A) \$20.34 B) \$23.04 C) \$23.40

D) \$24.03 E) \$24.30

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24. The frequency of a radio wave (kHz) varies inversely as the wavelength (m). If a wave 250 m long has a frequency of about 1200 kHz, approximate the length of a wave with a frequency of 800 kHz.

A) $\approx$ 167 m B) $\approx$ 258 m C) $\approx$ 325 m

D) $\approx$ 375 m E) $\approx$ 475 m

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25. The load that a beam of fixed length can support varies jointly as its width and the **square** of its depth. A beam 40 cm wide and 20 cm deep can support a load of 880 kg. How much can a beam 10 cm wide and 50 cm deep support?

A) 35.2 kg B) 275 kg C) 687.5 kg

D) 1375 kg E) 2750 kg