

9.1-9.3 Practice Quiz

$$1. \sqrt{112x^3} = \sqrt{16 \cdot 7 \cdot x^2 \cdot x} = \sqrt{16} \cdot \sqrt{7} \cdot \sqrt{x^2} \cdot \sqrt{x} = 4x\sqrt{7x}$$

$$2. \sqrt{\frac{18}{81}} = \sqrt{\frac{2}{9}} = \frac{\sqrt{2}}{\sqrt{9}} = \frac{\sqrt{2}}{3}$$

$$3. \sqrt[3]{-625} = \sqrt[3]{-125} \cdot \sqrt[3]{5} = -5\sqrt[3]{5}$$

$$4. \frac{12}{132} = \frac{12}{\sqrt{16} \cdot 2} = \frac{12}{4\sqrt{2}} = \frac{3}{\sqrt{2}} \cdot \frac{\sqrt{2}}{\sqrt{2}} = \frac{3\sqrt{2}}{2}$$

$$5. \frac{4}{\sqrt{11}} \cdot \frac{\sqrt{11}}{\sqrt{11}} = \frac{4\sqrt{11}}{11}$$

$$6. \sqrt{\frac{144}{13}} = \frac{\sqrt{144}}{\sqrt{13}} = \frac{12}{\sqrt{13}} \cdot \frac{\sqrt{13}}{\sqrt{13}} = \frac{12\sqrt{13}}{13}$$

$$7. \sqrt[3]{\frac{54x^4}{343y^6}} = \frac{\sqrt[3]{54x^4}}{\sqrt[3]{343y^6}} = \frac{\sqrt[3]{27 \cdot 2 \cdot x^3 \cdot x}}{7y^2} = \frac{3x\sqrt[3]{2x}}{7y^2}$$

$$8. \sqrt{\frac{4x^2}{28y^4z^5}} = \frac{\sqrt{4x^2}}{\sqrt{28y^4z^5}} = \frac{2x}{\sqrt{4 \cdot 7 \cdot y^4 \cdot z^4 \cdot z}} = \frac{2x}{2y^2z^2\sqrt{7z}} = \frac{x\sqrt{7z}}{7y^2z^3}$$

$$9. \frac{6}{(5+\sqrt{3})} \cdot \frac{(5-\sqrt{3})}{(5-\sqrt{3})} = \frac{30-6\sqrt{3}}{25-5\sqrt{3}+5\sqrt{3}-19} = \frac{30-6\sqrt{3}}{25-3} = \frac{30-6\sqrt{3}}{22} = \frac{15-3\sqrt{3}}{11}$$

$$10. 2\sqrt{5} + 7\sqrt{10} - 3\sqrt{20} = 2\sqrt{5} + 7\sqrt{10} - 3\sqrt{4 \cdot 5} = 2\sqrt{5} + 7\sqrt{10} - 3 \cdot 2\sqrt{5} \\ = 2\sqrt{5} + 7\sqrt{10} - 6\sqrt{5} = 7\sqrt{10} - 4\sqrt{5}$$

$$11. \frac{10}{\sqrt{8}-\sqrt{10}} \cdot \frac{(\sqrt{8}+\sqrt{10})}{(\sqrt{8}+\sqrt{10})} = \frac{10\sqrt{8}+10\sqrt{10}}{8+\sqrt{80}-\sqrt{80}-10} = \frac{10\sqrt{4 \cdot 2}+10\sqrt{10}}{8-10} = \frac{20\sqrt{2}+10\sqrt{10}}{-2} \\ = -10\sqrt{2}-5\sqrt{10}$$

$$12. \sqrt{6}(\sqrt{12}-4\sqrt{3}) = \sqrt{6}(\sqrt{4 \cdot 3}-4\sqrt{3}) = \sqrt{6}(14\sqrt{3}-4\sqrt{3}) = \sqrt{6}(10\sqrt{3}) = 10\sqrt{18} \\ 10\sqrt{9 \cdot 2} = 30\sqrt{2}$$

13. $x = -1$ or $x = 3$

14. No real solutions

15. $x = -5$

16. $x^2 + 9x + 14 = 0$

$$x^2 + 9x + 14 = y$$

$$\uparrow a=1 \quad b=9 \quad c=14$$

$$x = \frac{-9}{2} = -4.5$$

$$(-4.5)^2 + 9(-4.5) + 14 = y$$

$$20.25 - 40.5 + 14 = y$$

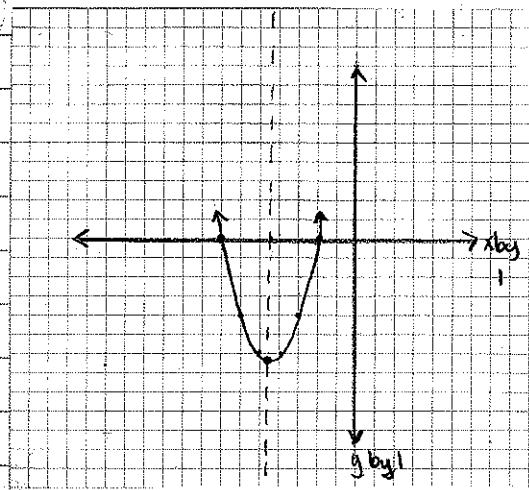
$$-6.25 = y \quad \text{vertex } (-4.5, -6.25)$$

$$x = -2 \text{ try}$$

$$(-2)^2 + 9(-2) + 14 = y$$

$$4 - 18 + 14 = y$$

$$0 = y \quad (-2, 0)$$



$$x = -2 \quad x = -7$$

17. $x^2 - 7x = 8$ $x^2 - 7x - 8 = 0$ $x^2 - 7x - 8 = y$

$$\uparrow a=1 \quad b=-7 \quad c=-8$$

$$x = \frac{7}{2} = 3.5 \quad \text{AoS}$$

$$\text{Vertex: } (3.5)^2 - 7(3.5) - 8 = y$$

$$12.25 - 24.5 - 8 = y \quad \text{vertex}$$

$$-20.5 = y \quad (3.5, -20.5)$$

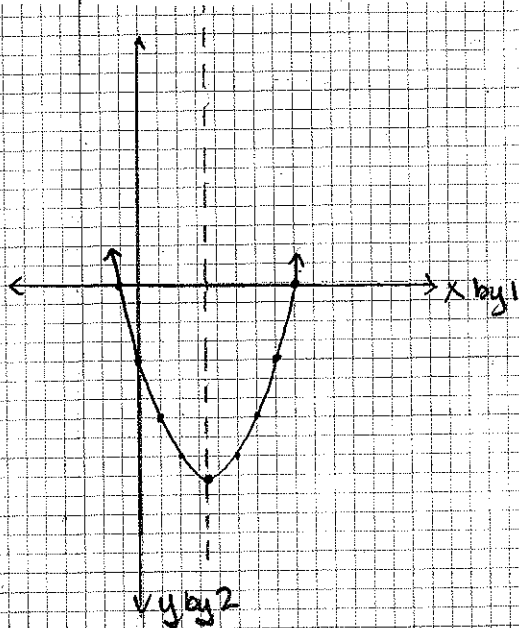
$$\text{Try } x = -1$$

$$(-1)^2 - 7(-1) - 8 = y$$

$$1 + 7 - 8 = y$$

$$0 = y \quad (-1, 0)$$

$$x = -1 \quad \text{or} \quad x = 8$$



$$18. x + 4 = -x^2$$

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

$$x^2 + x + 4 = y$$

$$\uparrow a=1 \quad b=1 \quad c=4$$

$$x = \frac{-1}{2}$$

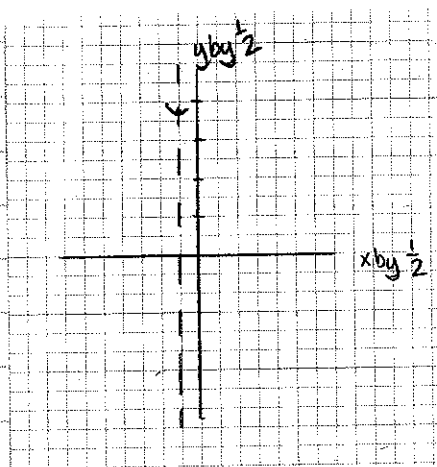
$$\left(-\frac{1}{2}\right)^2 + \left(-\frac{1}{2}\right) + 4 = y$$

$$\frac{1}{4} - \frac{1}{2} + 4 = y$$

$$3\frac{3}{4} = y$$

$$\left(-\frac{1}{2}, 3\frac{3}{4}\right)$$

No solutions



$$19. \frac{4x^2}{4} = \frac{64}{4}$$

$$\sqrt{x^2} = \sqrt{16}$$

$$x = \pm 4$$

$$20. -3x^2 + 6 = 10$$

$$-3x^2 = 4$$

$$x^2 = -\frac{3}{4}$$

No real solutions

$$21. (x-8)^2 = 1$$

$$\sqrt{(x-8)^2} = \sqrt{1}$$

$$x-8 = \pm 1$$

$$x = 8 \pm 1$$

$$x = 9 \text{ or } x = 7$$

(positive)

⇒ 22. Because $100 > 0$, we know the equation has 2 real solutions.

$$23. l = \text{length}$$

$$w = \text{width}$$

$$h = 5 \text{ m}$$

$$V = 380 \text{ m}^3$$

$$w = \sqrt{19} \approx 4.36 \text{ m}$$

$$l = 4\sqrt{19} \approx 17.44 \text{ m}$$

$$l = 4w$$

$$V = lwh$$

$$380 = (4w)(w)(5)$$

$$380 = 20w^2$$

$$19 = w^2$$

$$\sqrt{19} = w \quad (\text{no negative root because width cannot be negative})$$

The width of the prism is about 4.36m and the length is about 17.44 m.