Algebra 101 worksheet 1 Solutions

1 Linear equations

1. $$c = \frac{L}{27} - \frac{W}{27}$$

2. $$L = \frac{19 - h}{K + 6}$$

3.

4. $$y = \frac{-W + q}{k - n}$$

5. $$t = \frac{X - z}{P - 1}$$

6. $$M = \frac{-k + n}{N - Q}$$

7.

8. $$u = \frac{x - 19}{q - 2}$$

9. $$D = \frac{V - y}{Q - g}$$

10. $$r = \frac{q}{25} - \frac{13}{25}$$

11. $$Y = \frac{6 - a}{e - 6}$$

12. $$X = -\frac{25}{12}$$

13. $$k = \frac{G + 20}{q - 11}$$

14. $$a = \frac{-Q + R}{R + 18}$$

15. $$z = \frac{M + 1}{X + 25}$$

16. $$V = \frac{f}{10} - \frac{3}{2}$$

17. $$N = \frac{25}{S - T}$$

18. $$m = \frac{-V + n}{q - 18}$$

19. $$D = \frac{9}{h + 21}$$

20. $$k = \frac{n - 22}{b + 23}$$

2 Quadratic equations

1. $$x = -23, x = -20$$

2. $$x = 0, x = \frac{4}{15}$$

3. $$x = -\frac{9}{5}, x = 0$$

4. $$x = \frac{1}{2} - \frac{\sqrt{11}i}{10}, x = \frac{1}{2} + \frac{\sqrt{11}i}{10}$$

5. $$x = -\frac{\sqrt{38}i}{6}, x = \frac{\sqrt{38}i}{6}$$

6. $$x = -\frac{\sqrt{91}}{7}, x = \frac{\sqrt{91}}{7}$$

7. $$x = -\frac{\sqrt{3}i}{3}, x = \frac{\sqrt{3}i}{3}$$

8. $$x = -\frac{9}{14} - \frac{\sqrt{3}i}{14}, x = -\frac{9}{14} + \frac{\sqrt{3}i}{14}$$

9. $$x = -\frac{\sqrt{30}i}{6}, x = \frac{\sqrt{30}i}{6}$$

10. $$x = -\frac{7}{29}$$

11. $$x = 3 - \frac{\sqrt{41}}{2}, x = 3 + \frac{\sqrt{41}}{2}$$

12. $$x = 5, x = 10$$

13. $$x = 2, x = 20$$

14. $$x = -5, x = 18$$

15. $$x = -26, x = 20$$

16. $$x = -\frac{11}{25}, x = 0$$

17. $$x = -9, x = -2$$

18. $$x = -7, x = 8$$

19. $$x = -\frac{9}{34} - \frac{\sqrt{327}i}{34}, x = -\frac{9}{34} + \frac{\sqrt{327}i}{34}$$

20. $$x = 2, x = 5$$

3 Compute the derivative

1. $$\frac{-\sin(x)+\cos(x)}{\sin(x)} - \frac{(\sin(x)+\cos(x))\cos(x)}{\sin^2(x)}$$

2. $$\frac{-14+\frac{1}{2\sqrt{x}}}{\sqrt{x}} - \frac{\sqrt{x}-14x+15}{2x^{\frac{3}{2}}}$$

3. $$\frac{e^x-\sin(x)}{\tan(x)} + \frac{(e^x+\cos(x))\left(-\tan^2(x)-1\right)}{\tan^2(x)}$$

4. $$\frac{30x+\tan^2(x)+5}{x} - \frac{15x^2+4x+\tan(x)}{x^2}$$

5. $$\frac{1-\sin(x)}{3x^3-15x^2-24} + \frac{(x+\cos(x))\left(-9x^2+30x\right)}{\left(3x^3-15x^2-24\right)^2}$$

6. $$\frac{\left(\sqrt{x}+\tan(x)\right)\sin(x)}{\cos^2(x)} + \frac{\tan^2(x)+1+\frac{1}{2\sqrt{x}}}{\cos(x)}$$

7. $$\frac{20-\sin(x)}{x} - \frac{20x+\cos(x)+11}{x^2}$$

8. $$\frac{-\sin(x)+\cos(x)}{\tan(x)} + \frac{(\sin(x)+\cos(x))\left(-\tan^2(x)-1\right)}{\tan^2(x)}$$

9. $$\frac{-24+\frac{1}{2\sqrt{x}}}{x} - \frac{\sqrt{x}-24x}{x^2}$$

10. $$-\frac{54x^2}{-18x^3-11x^2} + \frac{\left(54x^2+22x\right)\left(-18x^3-24\right)}{\left(-18x^3-11x^2\right)^2}$$