Example Worksheet 1 Solutions

1 Linear equations

1. $$C = \frac{-T + X}{S - h}$$

2. $$H = -\frac{W}{18} - \frac{8}{9}$$

3. $$k = 0$$

4. $$h = \frac{18}{5}$$

5. $$t = \frac{q - 20}{X - 15}$$

6. $$N = \frac{-P + 17}{H - h}$$

7. $$h = \frac{A - q}{B - p}$$

8. $$H = \frac{39}{31}$$

9. $$a = -n - 23$$

10. $$w = \frac{L - p}{M - Z}$$

11. $$X = \frac{E}{21} + \frac{16}{21}$$

12. $$J = -\frac{y + 14}{H + 13}$$

13. $$x = -\frac{1}{k + 19}$$

14. $$h = \frac{S - 20}{G - 16}$$

15. $$d = \frac{-a + 3}{L - 9}$$

16. $$y = -\frac{U}{35} + \frac{2}{5}$$

17. $$f = \frac{9}{A + 15}$$

18. $$r = -\frac{d}{23} - \frac{18}{23}$$

19. $$z = \frac{-D + b}{M - y}$$

20. $$g = \frac{y}{3} - 6$$

2 Quadratic equations

1. $$y = -11, y = 5$$

2. $$x = -25, x = 3$$

3. $$x = \frac{1}{4} + \frac{\sqrt{497}}{28}, x = -\frac{\sqrt{497}}{28} + \frac{1}{4}$$

4. $$x = \frac{10}{11} + \frac{\sqrt{818}}{22}, x = -\frac{\sqrt{818}}{22} + \frac{10}{11}$$

5. $$y = -22, y = 15$$

6. $$y = -1, y = 21$$

7. $$x = -\frac{1}{6} + \frac{\sqrt{19}}{6}, x = -\frac{\sqrt{19}}{6} - \frac{1}{6}$$

8. $$x = -\frac{9}{14} + \frac{\sqrt{1453}}{14}, x = -\frac{\sqrt{1453}}{14} - \frac{9}{14}$$

9. $$x = 0, x = \frac{13}{4}$$

10. $$x = -13, x = 9$$

11. $$x = 0, x = 1$$

12. $$y = \frac{1}{54} + \frac{\sqrt{1081}}{54}, y = -\frac{\sqrt{1081}}{54} + \frac{1}{54}$$

13. $$y = -15, y = 6$$

14. $$x = -\frac{\sqrt{69}}{6}, x = \frac{\sqrt{69}}{6}$$

15. $$y = -\frac{11}{54} - \frac{\sqrt{2795}i}{54}, y = -\frac{11}{54} + \frac{\sqrt{2795}i}{54}$$

16. $$y = 0$$

17. $$x = -13, x = 6$$

18. $$y = 12, y = 22$$

19. $$x = -\frac{22}{39}, x = 0$$

20. $$y = -\frac{17}{9}, y = 0$$

3 Differentiation

1. $$-\frac{1}{24x}\left(\cos\left(x\right)+\frac{1}{x}\right)+\frac{1}{24x^{2}}\left(\log\left(x\right)+\sin\left(x\right)\right)$$

2. $$\frac{\frac{1}{x}+\frac{1}{2\sqrt{x}}}{11x+2}-\frac{11\left(\sqrt{x}+\log\left(x\right)\right)}{\left(11x+2\right)^{2}}$$

3. $$\frac{7+\frac{1}{2\sqrt{x}}}{10x+17}-\frac{10\left(\sqrt{x}+7x+2\right)}{\left(10x+17\right)^{2}}$$

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

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

6. $$\frac{-6x+20}{\sin\left(x\right)}-\frac{\cos\left(x\right)}{\sin^{2}\left(x\right)}\left(-3x^{2}+20x+23\right)$$

7. $$0$$

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

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

10. $$\frac{1}{\cos\left(x\right)}\left(60x^{2}-32x+18+\frac{1}{x}\right)+\frac{\sin\left(x\right)}{\cos^{2}\left(x\right)}\left(20x^{3}-16x^{2}+18x+\log\left(x\right)\right)$$

4 Compute the integral

1. $$5z^2 + C$$
2. $$-5z + C$$
3. $$14y + C$$
4. $$-\frac{11y^3}{3} + C$$
5. $$\frac{9z^2}{2} + C$$
6. $$\frac{23z^3}{3} - \frac{5z^2}{2} + 2z + C$$
7. $$8y^2 + 24y + C$$
8. $$\frac{14y^3}{3} + C$$
9. $$10z^2 + C$$
10. $$y^2 - 23y + C$$

5 Compute the integral

1. $$\frac{3y^{\frac{4}{3}}}{4} + C$$
2. $$\frac{z^2}{2} + C$$
3. $$\frac{3z^{\frac{4}{3}}}{4} + C$$

4. $$\frac{4z^{\frac{5}{4}}}{5} + C$$

5. $$\frac{2z^{\frac{3}{2}}}{3} + C$$

6. $$\frac{4z^{\frac{5}{4}}}{5} + C$$

7. $$\frac{2y^{\frac{3}{2}}}{3} + C$$

8. $$\frac{4z^{\frac{5}{4}}}{5} + C$$

9. $$\frac{z^2}{2} + C$$

10. $$\frac{3z^{\frac{4}{3}}}{4} + C$$