Example Worksheet 1

1 Linear equations

Solve the following equations for the specified variable.

1. Solve for G :
$$Gb + d = -G - 20$$
2. Solve for c :
$$Sc - 11 = -2c + 14$$
3. Solve for y :
$$H - 16y = d + 8y$$
4. Solve for J :
$$HJ - 12 = JM + 11$$
5. Solve for r :
$$mr + 12 = Y - 19r$$
6. Solve for T :
$$5T - 11 = -20T - 9$$
7. Solve for J :
$$Js + K = -25J - 13$$
8. Solve for m :
$$-4m - 21 = R + km$$
9. Solve for J :
$$JK + 8 = JS + 15$$
10. Solve for U :
$$UZ + h = -2U - 10$$
11. Solve for m :
$$10m - 17 = -9m + 16$$
12. Solve for T :
$$-22T + 23 = G + 13T$$
13. Solve for j :
$$-j + u = f - 18j$$
14. Solve for F :
$$24F + J = -2F - 22$$
15. Solve for s :
$$K + 21s = Z - 16s$$
16. Solve for X :
$$W + 14X = Xa + 10$$
17. Solve for m :
$$Pm - 21 = a + cm$$
18. Solve for P :
$$JP + s = PQ + c$$
19. Solve for e :
$$-12e + 5 = Ze - 3$$
20. Solve for H :
$$HW + p = HM + s$$

2 Quadratic equations

Solve the following quadratic equations.

1. $$-11y^2 - 3y + 5 = -12y$$
2. $$-20y^2 + 10y + 7 = 3y^2 - 12$$
3. $$y^2 + 40y + 399 = 0$$
4. $$y^2 - 13y + 40 = 0$$
5. $$x^2 + 13x + 30 = 0$$
6. $$x^2 - 11x - 12 = 0$$
7. $$x^2 + 6x + 5 = 0$$
8. $$-19x^2 + 22x + 1 = -20$$
9. $$x^2 + 20x + 96 = 0$$
10. $$19x^2 + 15x = -19x^2 + 25$$
11. $$x^2 - 33x + 270 = 0$$
12. $$23x^2 - 23x - 5 = -9x^2 - 13x + 12$$
13. $$y^2 - 19y - 66 = 0$$
14. $$10y^2 + 15 = -y + 3$$
15. $$y^2 + 9y - 442 = 0$$
16. $$-2y^2 - 24 = 22y^2$$
17. $$20x^2 + 8x = 20x - 5$$
18. $$-7y^2 - 9y = 5y^2 + 7y - 21$$
19. $$x^2 - 3x - 504 = 0$$
20. $$-18x^2 + 13x - 5 = 0$$

3 Differentiation

Compute each derivative

1. $$\frac{d}{dy}\left(\frac{-11y^2 + e^y + 10}{\sin(y)}\right)$$
2. $$\frac{d}{dy}2$$

3. $\frac{d}{dx}\left(\frac{-15x^3 - x + e^x}{-7x^3 - 2x^2 + 20x - 18}\right)$

4. $\frac{d}{dy}\left(\frac{y + \cos(y)}{9y^3 - 25y^2 - y - 19}\right)$

5. $\frac{d}{dx}\left(\frac{4x^3 + 32x^2 - 8x}{\tan(x)}\right)$

6. $\frac{d}{dx}\left(\frac{1}{\log(x)}\left(\sqrt{x} - 9x^3 + 15x - 24\right)\right)$

7. $\frac{d}{dz}\left(\frac{z + \sin(z)}{\cos(z)}\right)$

8. $\frac{d}{dz}\left(\frac{1}{z}\left(-19z^3 - 8z^2 - 24z\right)\right)$

9. $\frac{d}{dx}\left(\frac{-6x^2 + 23x}{\sin(x)}\right)$

10. $\frac{d}{dz}\left(\frac{1}{\sqrt{z}}\left(z + \tan(z)\right)\right)$

4 Compute the integral

Compute the integral of the polynomials.

1. $\int \left(11y^3 + 16y^2 - 5y - 23\right)\, dy$

2. $\int \left(-15z^2 - 14z - 11\right)\, dz$

3. $\int (22y + 19)\, dy$

4. $\int (-7z)\, dz$

5. $\int 18\, dz$

6. $\int \left(17y^3 + 23y - 21\right)\, dy$

7. $\int \left(-21y^2\right)\, dy$

8. $\int 9\, dz$

9. $\int (-13)\, dy$

10. $\int (-16z + 20)\, dz$

5 Compute the integral

Compute the integral of the powers.

1. $\int \sqrt{y}\, dy$

2. $\int \sqrt[4]{z}\, dz$

3. $\int \sqrt[3]{y}\, dy$

4. $\int \sqrt[4]{y}\, dy$

5. $\int \sqrt[3]{z}\, dz$

6. $\int \sqrt{z}\, dz$

7. $\int z\, dz$

8. $\int \sqrt[4]{y}\, dy$

9. $\int y\, dy$

10. $\int z\, dz$