

# Algebra 101 worksheet 1

## 1 Linear equations

Solve the following equations for the specified variable.

1. Solve for  $a$  :

$$Ha + 5 = 14a + g$$

2. Solve for  $N$  :

$$NS + 5 = Nw - 11$$

3. Solve for  $A$  :

$$AE - 4 = 6A + h$$

4. Solve for  $w$  :

$$6w + z = 21w + 23$$

5. Solve for  $b$  :

$$K + 23b = Yb + 5$$

6. Solve for  $M$  :

$$MS - 4 = 4M + 6$$

7. Solve for  $y$  :

$$Xy + z = Ty + V$$

8. Solve for  $p$  :

$$-2p + 18 = Qp + 12$$

9. Solve for  $p$  :

$$g - 5p = V + pt$$

10. Solve for  $H$  :

$$EH + 20 = Hu + y$$

11. Solve for  $M$  :

$$MR - 10 = Mk + R$$

12. Solve for  $M$  :

$$-26M + 9 = Mj + b$$

13. Solve for  $V$  :

$$P + SV = QV + X$$

14. Solve for  $P$  :

$$-10P + e = -23P + 1$$

15. Solve for  $g$  :

$$-14g + 16 = -21g - 21$$

16. Solve for  $K$  :

$$-23K + S = KT - 6$$

17. Solve for  $d$  :

$$Q - 10d = Nd - 24$$

18. Solve for  $D$  :

$$8D - 5 = Dm + 22$$

19. Solve for  $E$  :

$$Eq + y = -5E + 2$$

20. Solve for  $r$  :

$$rx + 10 = c - 5r$$

## 2 Quadratic equations

Solve the following quadratic equations.

- |     |                                 |     |                             |
|-----|---------------------------------|-----|-----------------------------|
| 1.  | $4y^2 = -15y - 10$              | 11. | $-3x^2 = 12x^2 - 4x$        |
| 2.  | $9x^2 = 19x + 11$               | 12. | $x^2 - 27x + 180 = 0$       |
| 3.  | $x^2 - 13x - 230 = 0$           | 13. | $y^2 - 8y + 12 = 0$         |
| 4.  | $2y^2 - 8 = y + 14$             | 14. | $x^2 - 6x - 391 = 0$        |
| 5.  | $2x^2 + 22x = 3x^2$             | 15. | $x^2 + 8x + 7 = 0$          |
| 6.  | $-16x^2 + 16x - 23 = -3x^2 + 2$ | 16. | $x^2 + 18x + 65 = 0$        |
| 7.  | $x^2 - 8x - 20 = 0$             | 17. | $-20x^2 + 5x - 21 = -24x^2$ |
| 8.  | $-7x^2 - 1 = 15x^2 + 2x - 15$   | 18. | $-21x^2 + 20x + 15 = 10x$   |
| 9.  | $-8x^2 - 24x = -13x^2$          | 19. | $-11y^2 = -24y^2 + 25y + 8$ |
| 10. | $-7y^2 - 25y = 3y^2 - 14y + 23$ | 20. | $4x^2 + 10x = 14x$          |

## 3 Compute the derivative

['x', 'y', 'z']

- |    |    |
|----|----|
| 1. | 2. |
|----|----|

$$\frac{d}{dx} \left( \frac{1}{x} (7x^2 + 12x - 24) \right)$$

$$\frac{d}{dx} \left( \frac{2\sqrt{x}}{-9x^3 + 18x + 7} \right)$$

3.

$$\frac{d}{dx} \left( \frac{\log(x) + \tan(x)}{16x^3 - 23x^2 + 5x} \right)$$

4.

$$\frac{d}{dx} ((e^x + \tan(x)) e^{-x})$$

5.

$$\frac{d}{dx} ((19x + e^x) e^{-x})$$

6.

$$\frac{d}{dx} \left( \frac{1}{x} (24x^2 + 7x + \cos(x)) \right)$$

7.

$$\frac{d}{dx} \left( \frac{1}{\tan(x)} (\log(x) + \sin(x)) \right)$$

8.

$$\frac{d}{dx} \left( \frac{1}{x} (4x^3 + \log(x) - 17) \right)$$

9.

$$\frac{d}{dx} \left( \frac{1}{\sin(x)} (-17x^3 + 24x^2 + 14x + \log(x) - 14) \right)$$

10.

$$\frac{d}{dx} ((\sqrt{x} + \log(x)) e^{-x})$$