EXPANSION

A DISTRIBUTIVE LAW 1

A.1 EXPANDING WITH ADDITION: LEVEL 1

Ex 1: Expand and simplify:

$$5(x+3) = \boxed{5x+15}$$

Answer:

$$\begin{aligned} 5\ (x+3) &= 5 \times x + 5 \times 3 \\ &= 5x + 15 \end{aligned}$$

Ex 2: Expand and simplify:

$$2(3+x) = \boxed{6+2x}$$

Answer:

$$\begin{aligned} 2\ (3+x) &= 2 \times 3 + 2 \times x \\ &= 6 + 2x \end{aligned}$$

Ex 3: Expand and simplify:

$$3(2x+2) = \boxed{6x+6}$$

Answer:

$$\begin{aligned} 3\ (2x+2) &= 3 \times 2x + 3 \times 2 \\ &= 6x + 6 \end{aligned}$$

Ex 4: Expand and simplify:

$$2(5+3x) = \boxed{10+6x}$$

Answer:

$$\begin{aligned} 2\ (5+3x) &= 2 \times 5 + 2 \times 3x \\ &= 10 + 6x \end{aligned}$$

A.2 EXPANDING WITH ADDITION: LEVEL 2

Ex 5: Expand and simplify:

$$x(x+1) = \boxed{x^2+x}$$

Answer:

$$\begin{aligned} x\ (x+1) &= x \times x + x \times 1 \\ &= x^2 + x \end{aligned}$$

Ex 6: Expand and simplify:

$$x(2x+3) = \boxed{2x^2+3x}$$

Answer:

$$\begin{aligned} x\ (2x+3) &= x \times 2x + x \times 3 \\ &= 2x^2 + 3x \end{aligned}$$

Ex 7: Expand and simplify:

$$2x(x+2) = \boxed{2x^2+4x}$$

Answer:

$$\begin{aligned} 2x\ (x+2) &= 2x \times x + 2x \times 2 \\ &= 2x^2 + 4x \end{aligned}$$

Ex 8: Expand and simplify:

$$3x(2x+5) = \boxed{6x^2+15x}$$

Answer:

$$\begin{aligned} 3x\ (2x+5) &= 3x \times 2x + 3x \times 5 \\ &= 6x^2 + 15x \end{aligned}$$

A.3 EXPANDING WITH ADDITION: LEVEL 3

Ex 9: Expand and simplify:

$$2(x+1) + x = \boxed{3x+2}$$

Answer:

$$\begin{aligned} 2(x+1) + x &= 2 \times x + 2 \times 1 + x && \text{(expanding)} \\ &= 2x + 2 + x \\ &= (2+1)x + 2 && \text{(combining)} \\ &= 3x + 2 && \text{(simplifying)} \end{aligned}$$

Ex 10: Expand and simplify:

$$2(2x+3) - 3x = \boxed{x+6}$$

Answer:

$$\begin{aligned} 2(2x+3) - 3x &= 2 \times 2x + 2 \times 3 - 3x && \text{(expanding)} \\ &= 4x + 6 - 3x \\ &= (4-3)x + 6 && \text{(combining)} \\ &= x + 6 && \text{(simplifying)} \end{aligned}$$

Ex 11: Expand and simplify:

$$x(x+2) - x^2 = \boxed{2x}$$

Answer:

$$\begin{aligned} x(x+2) - x^2 &= x \times x + x \times 2 - x^2 && \text{(expanding)} \\ &= x^2 + 2x - x^2 \\ &= 2x && \text{(combining)} \end{aligned}$$

Ex 12: Expand and simplify:

$$2x(3x+2) - 8x = \boxed{6x^2-4x}$$

Answer:

$$\begin{aligned} 2x(3x+2) - 8x &= 2x \times 3x + 2x \times 2 - 8x && \text{(expanding)} \\ &= 6x^2 + 4x - 8x \\ &= 6x^2 + (4-8)x && \text{(combining)} \\ &= 6x^2 - 4x && \text{(simplifying)} \end{aligned}$$

A.4 EXPANDING WITH SUBTRACTION: LEVEL 1

Ex 13: Expand and simplify:

$$2(x-2) = \boxed{2x-4}$$

Answer:

$$\begin{aligned} 2\,(x-2) &= 2\times x - 2\times 2 \\ &= 2x-4 \end{aligned}$$

Ex 14: Expand and simplify:

$$3(5x-6) = \boxed{15x-18}$$

Answer:

$$\begin{aligned} 3\,(5x-6) &= 3\times 5x - 3\times 6 \\ &= 15x-18 \end{aligned}$$

Ex 15: Expand and simplify:

$$2(3-x) = \boxed{6-2x}$$

Answer:

$$\begin{aligned} 2\,(3-x) &= 2\times 3 - 2\times x \\ &= 6-2x \end{aligned}$$

Ex 16: Expand and simplify:

$$4(3-5x) = \boxed{12-20x}$$

Answer:

$$\begin{aligned} 4\,(3-5x) &= 4\times 3 - 4\times 5x \\ &= 12-20x \end{aligned}$$

A.5 EXPANDING WITH SUBTRACTION: LEVEL 2

Ex 17: Expand and simplify:

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

Answer:

$$\begin{aligned} x\,(x-1) &= x\times x - x\times 1 \\ &= x^2-x \end{aligned}$$

Ex 18: Expand and simplify:

$$x(2x-3) = \boxed{2x^2-3x}$$

Answer:

$$\begin{aligned} x\,(2x-3) &= x\times 2x - x\times 3 \\ &= 2x^2-3x \end{aligned}$$

Ex 19: Expand and simplify:

$$2x(x-2) = \boxed{2x^2-4x}$$

Answer:

$$\begin{aligned} 2x\,(x-2) &= 2x\times x - 2x\times 2 \\ &= 2x^2-4x \end{aligned}$$

Ex 20: Expand and simplify:

$$3x(2x-5) = \boxed{6x^2-15x}$$

Answer:

$$\begin{aligned} 3x\,(2x-5) &= 3x\times 2x - 3x\times 5 \\ &= 6x^2-15x \end{aligned}$$

A.6 EXPANDING WITH SUBTRACTION: LEVEL 3

Ex 21: Expand and simplify

$$2(x-2)+4 = \boxed{2x}$$

Answer:

$$\begin{aligned} 2(x-2)+4 &= 2\times x - 2\times 2 + 4 && \text{(expanding)} \\ &= 2x-4+4 \\ &= 2x+0 && \text{(simplifying)} \\ &= 2x \end{aligned}$$

Ex 22: Expand and simplify

$$4(x-3)-5x = \boxed{-x-12}$$

Answer:

$$\begin{aligned} 4(x-3)-5x &= 4\times x - 4\times 3 - 5x && \text{(expanding)} \\ &= 4x-12-5x \\ &= (4-5)x-12 && \text{(combining like terms)} \\ &= -x-12 && \text{(simplifying)} \end{aligned}$$

Ex 23: Expand and simplify

$$x(x-2)+6 = \boxed{x^2-2x+6}$$

Answer:

$$\begin{aligned} x(x-2)+6 &= x\times x - x\times 2 + 6 && \text{(expanding)} \\ &= x^2-2x+6 \end{aligned}$$

Ex 24: Expand and simplify

$$2(x-2)+3x-10 = \boxed{5x-14}$$

Answer:

$$\begin{aligned} 2(x-2)+3x-10 &= 2\times x - 2\times 2 + 3x - 10 && \text{(expanding)} \\ &= 2x-4+3x-10 \\ &= (2+3)x-4-10 && \text{(combining like terms)} \\ &= 5x-14 && \text{(simplifying)} \end{aligned}$$

A.7 EXPANDING: LEVEL 4

Ex 25: Expand and simplify:

$$x(x^2 - x + 1) = \boxed{x^3 - x^2 + x}$$

Answer:

$$\begin{aligned} x(x^2 - x + 1) &= x \times x^2 + x \times (-x) + x \times 1 \\ &= x^3 - x^2 + x \end{aligned}$$

Ex 26: Expand and simplify:

$$2x(-x^3 + 2x - 2) = \boxed{-2x^4 + 4x^2 - 4x}$$

Answer:

$$\begin{aligned} 2x(-x^3 + 2x - 2) &= 2x \times (-x^3) + 2x \times 2x + 2x \times (-2) \\ &= -2x^4 + 4x^2 - 4x \end{aligned}$$

Ex 27: Expand and simplify:

$$-2(x^2 - 2x - 3) = \boxed{-2x^2 + 4x + 6}$$

Answer:

$$\begin{aligned} -2(x^2 - 2x - 3) &= (-2) \times x^2 + (-2) \times (-2x) + (-2) \times (-3) \\ &= -2x^2 + 4x + 6 \end{aligned}$$

Ex 28: Expand and simplify:

$$-2x(-x^2 - 3x + 2) = \boxed{2x^3 + 6x^2 - 4x}$$

Answer:

$$\begin{aligned} -2x(-x^2 - 3x + 2) &= (-2x) \times (-x^2) + (-2x) \times (-3x) + (-2x) \times 2 \\ &= 2x^3 + 6x^2 - 4x \end{aligned}$$

A.8 EXPANDING: LEVEL 4

Ex 29: Expand and simplify:

$$2(x + 2) - x(x + 2) = \boxed{-x^2 + 4}$$

Answer:

$$\begin{aligned} 2(x + 2) - x(x + 2) &= 2 \times x + 2 \times 2 + (-x) \times x + (-x) \times 2 \\ &= 2x + 4 - x^2 - 2x \\ &= -x^2 + 4 \end{aligned}$$

Ex 30: Expand and simplify:

$$-2x(x - 4) + x(x - 3) = \boxed{-x^2 + 5x}$$

Answer:

$$\begin{aligned} -2x(x - 4) + x(x - 3) &= (-2x) \times x + (-2x) \times (-4) + x \times x + x \times (-3) \\ &= -2x^2 + 8x + x^2 - 3x \\ &= -x^2 + 5x \end{aligned}$$

Ex 31: Expand and simplify:

$$2x - 2(4 - x + x^2) = \boxed{-2x^2 + 4x - 8}$$

Answer:

$$\begin{aligned} 2x - 2(4 - x + x^2) &= 2x + (-2) \times 4 + (-2) \times x + +(-2) \times x^2 \\ &= 2x - 8 + 2x - 2x^2 \\ &= -2x^2 + 4x - 8 \end{aligned}$$

Ex 32: Expand and simplify:

$$x - x(x^2 + x + 1) = \boxed{-x^3 - x^2}$$

Answer:

$$\begin{aligned} x - x(x^2 + x + 1) &= x - x \times x^2 - x \times x - x \times 1 \\ &= x - x^3 - x^2 - x \\ &= -x^3 - x^2 \end{aligned}$$

B DISTRIBUTIVE LAW 2

B.1 EXPANDING WITH ADDITION

Ex 33: Expand and simplify

$$(x + 2)(x + 1) = \boxed{x^2 + 3x + 2}$$

Answer:

$$\begin{aligned} (x+2)\cdot(x+1) &= x \times x + x \times 1 + 2 \times x + 2 \times 1 \\ &= x^2 + x + 2x + 2 \\ &= x^2 + 3x + 2 \end{aligned}$$

Ex 34: Expand and simplify

$$(x + 3)(x + 4) = \boxed{x^2 + 7x + 12}$$

Answer:

$$\begin{aligned} (x+3)\cdot(x+4) &= x \times x + x \times 4 + 3 \times x + 3 \times 4 \\ &= x^2 + 4x + 3x + 12 \\ &= x^2 + 7x + 12 \end{aligned}$$

Ex 35: Expand and simplify

$$(x + 4)(2x + 2) = \boxed{2x^2 + 10x + 8}$$

Answer:

$$\begin{aligned} (x+4)\cdot(2x+2) &= x \times 2x + x \times 2 + 4 \times 2x + 4 \times 2 \\ &= 2x^2 + 2x + 8x + 8 \\ &= 2x^2 + 10x + 8 \end{aligned}$$

Ex 36: Expand and simplify

$$(2x + 1)(3x + 2) = \boxed{6x^2 + 7x + 2}$$

Answer:

$$(2x+1)\cdot(3x+2) = 2x\times 3x + 2x\times 2 + 1\times 3x + 1\times 2$$
$$= 6x^2 + 4x + 3x + 2$$
$$= 6x^2 + 7x + 2$$

Ex 37: Expand and simplify

$$(x+1)^2 = \boxed{x^2+2x+1}$$

Answer:

$$\begin{aligned}(x+1)^2 &= (x+1)(x+1) && \text{(square definition)}\\ &= x\times x + x\times 1 + 1\times x + 1\times 1 && \text{(expanding)}\\ &= x^2 + 2x + 1 && \text{(combining)}\end{aligned}$$

B.2 EXPANDING WITH SUBTRACTION

Ex 38: Expand and simplify

$$(x+2)(x-1) = \boxed{x^2+x-2}$$

Answer:

$$(x+2)\cdot(x-1) = x\times x + x\times(-1) + 2\times x + 2\times(-1)$$
$$= x^2 - x + 2x - 2$$
$$= x^2 + x - 2$$

Ex 39: Expand and simplify

$$(x-1)(x-2) = \boxed{x^2-3x+2}$$

Answer:

$$(x-1)\cdot(x-2) = x\times x + x\times(-2) + (-1)\times x + (-1)\times(-2)$$
$$= x^2 - 2x - x + 2$$
$$= x^2 - 3x + 2$$

Ex 40: Expand and simplify

$$(x+3)(x-2) = \boxed{x^2+x-6}$$

Answer:

$$(x+3)\cdot(x-2) = x\times x + x\times(-2) + 3\times x + 3\times(-2)$$
$$= x^2 - 2x + 3x - 6$$
$$= x^2 + x - 6$$

Ex 41: Expand and simplify

$$(2x+1)(1-2x) = \boxed{1-4x^2}$$

Answer:

$$(2x+1)\cdot(1-2x) = 2x\times 1 + 2x\times(-2x) + 1\times 1 + 1\times(-2x)$$
$$= 2x - 4x^2 + 1 - 2x$$
$$= 1 - 4x^2$$

Ex 42: Expand and simplify

$$(-1+2x)(1-x) = \boxed{-2x^2+3x-1}$$

Answer:

$$(-1+2x)\cdot(1-x) = (-1)\times 1 + (-1)\times(-x) + 2x\times 1 + 2x\times(-x)$$
$$= -1 + x + 2x - 2x^2$$
$$= -2x^2 + 3x - 1$$

B.3 EXPANDING

Ex 43: Expand and simplify:

$$(x-5)(2x+7) = \boxed{2x^2-3x-35}$$

Answer:

$$(x-5)(2x+7) = x\times 2x + x\times 7 + (-5)\times 2x + (-5)\times 7$$
$$= 2x^2 + 7x - 10x - 35$$
$$= 2x^2 - 3x - 35$$

Ex 44: Expand and simplify:

$$(4x+1)(x-6) = \boxed{4x^2-23x-6}$$

Answer:

$$(4x+1)(x-6) = 4x\times x + 4x\times(-6) + 1\times x + 1\times(-6)$$
$$= 4x^2 - 24x + x - 6$$
$$= 4x^2 - 23x - 6$$

Ex 45: Expand and simplify:

$$(2x-3)(-x+4) = \boxed{-2x^2+11x-12}$$

Answer:

$$(2x-3)(-x+4) = 2x\times(-x) + 2x\times 4 + (-3)\times(-x) + (-3)\times 4$$
$$= -2x^2 + 8x + 3x - 12$$
$$= -2x^2 + 11x - 12$$

Ex 46: Expand and simplify:

$$(-x+2)(3x-4) = \boxed{-3x^2+10x-8}$$

Answer:

$$(-x+2)(3x-4) = (-x)\times 3x + (-x)\times(-4) + 2\times 3x + 2\times(-4)$$
$$= -3x^2 + 4x + 6x - 8$$
$$= -3x^2 + 10x - 8$$

C DIFFERENCE OF TWO SQUARES

C.1 EXPANDING: LEVEL 1

Ex 47: Expand and simplify

$$(x+1)(x-1) = \boxed{x^2-1}$$

Answer:

$$(x+1)(x-1) = x^2 - 1^2$$
$$= x^2 - 1$$

Ex 48: Expand and simplify

$$(x-3)(x+3) = \boxed{x^2-9}$$

Answer:

$$(x-3)(x+3) = x^2 - 3^2$$
$$= x^2 - 9$$

Ex 49: Expand and simplify

$$(4-x)(4+x) = \boxed{16-x^2}$$

Answer:

$$\begin{aligned}(4-x)(4+x) &= 4^2 - x^2 \\ &= 16 - x^2\end{aligned}$$

Ex 50: Expand and simplify

$$(5+x)(5-x) = \boxed{25-x^2}$$

Answer:

$$\begin{aligned}(5+x)(5-x) &= 5^2 - x^2 \\ &= 25 - x^2\end{aligned}$$

C.2 EXPANDING: LEVEL 2

Ex 51: Expand and simplify

$$(2x-4)(2x+4) = \boxed{4x^2-16}$$

Answer:

$$\begin{aligned}(2x-4)(2x+4) &= (2x)^2 - (4)^2 \\ &= 2^2x^2 - 4^2 \\ &= 4x^2 - 16\end{aligned}$$

Ex 52: Expand and simplify

$$(x+\sqrt{2})(x-\sqrt{2}) = \boxed{x^2-2}$$

Answer:

$$\begin{aligned}(x+\sqrt{2})(x-\sqrt{2}) &= x^2 - (\sqrt{2})^2 \\ &= x^2 - 2\end{aligned}$$

Ex 53: Expand and simplify

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

Answer:

$$\begin{aligned}\left(\frac{1}{2}-x\right)\left(\frac{1}{2}+x\right) &= \left(\frac{1}{2}\right)^2 - x^2 \\ &= \frac{1^2}{2^2} - x^2 \\ &= \frac{1}{4} - x^2\end{aligned}$$

Ex 54: Expand and simplify

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

Answer:

$$\begin{aligned}\left(\frac{x}{2}-1\right)\left(\frac{x}{2}+1\right) &= \left(\frac{x}{2}\right)^2 - (1)^2 \\ &= \frac{x^2}{2^2} - 1^2 \\ &= \frac{x^2}{4} - 1\end{aligned}$$

D BINOMIAL EXPANSION

D.1 EXPANDING PERFECT SQUARE BINOMIALS (ADDITION)

Ex 55: Expand and simplify

$$(x+2)^2 = \boxed{x^2+4x+4}$$

Answer: In the perfect squares expansion, we substitute $a = x$ and $b = 2$:

$$\begin{aligned}(x+2)^2 &= x^2 + 2 \times x \times 2 + 2^2 \\ &= x^2 + 4x + 4\end{aligned}$$

Ex 56: Expand and simplify

$$(3+x)^2 = \boxed{9+6x+x^2}$$

Answer: In the perfect squares expansion, we substitute $a = 3$ and $b = x$:

$$\begin{aligned}(3+x)^2 &= 3^2 + 2 \times 3 \times x + x^2 \\ &= 9 + 6x + x^2\end{aligned}$$

Ex 57: Expand and simplify

$$(2x+1)^2 = \boxed{4x^2+4x+1}$$

Answer: In the perfect squares expansion, we substitute $a = 2x$ and $b = 1$:

$$\begin{aligned}(2x+1)^2 &= (2x)^2 + 2 \times 2x \times 1 + (1)^2 \\ &= 2^2x^2 + 4x + 1 \\ &= 4x^2 + 4x + 1\end{aligned}$$

Ex 58: Expand and simplify

$$(2+3x)^2 = \boxed{4+12x+9x^2}$$

Answer: In the perfect squares expansion, we substitute $a = 2$ and $b = 3x$:

$$\begin{aligned}(2+3x)^2 &= 2^2 + 2 \times 2 \times 3x + (3x)^2 \\ &= 4 + 12x + 3^2x^2 \\ &= 4 + 12x + 9x^2\end{aligned}$$

D.2 EXPANDING PERFECT SQUARE BINOMIALS (SUBTRACTION)

Ex 59: Expand and simplify

$$(x-2)^2 = \boxed{x^2-4x+4}$$

Answer: In the perfect squares expansion, we substitute $a = x$ and $b = 2$:

$$\begin{aligned}(x-2)^2 &= x^2 - 2 \times x \times 2 + 2^2 \\ &= x^2 - 4x + 4\end{aligned}$$

Ex 60: Expand and simplify

$$(3-x)^2 = \boxed{9-6x+x^2}$$

Answer: In the perfect squares expansion, we substitute $a = 3$ and $b = x$:

$$\begin{aligned}(3 - x)^2 &= 3^2 - 2 \times 3 \times x + x^2 \\ &= 9 - 6x + x^2\end{aligned}$$

Ex 61: Expand and simplify

$$(2x - 1)^2 = \boxed{4x^2 - 4x + 1}$$

Answer: In the perfect squares expansion, we substitute $a = 2x$ and $b = 1$:

$$\begin{aligned}(2x - 1)^2 &= (2x)^2 - 2 \times 2x \times 1 + (1)^2 \\ &= 4x^2 - 4x + 1\end{aligned}$$

Ex 62: Expand and simplify

$$(2 - 3x)^2 = \boxed{4 - 12x + 9x^2}$$

Answer: In the perfect squares expansion, we substitute $a = 2$ and $b = 3x$:

$$\begin{aligned}(2 - 3x)^2 &= 2^2 - 2 \times 2 \times 3x + (3x)^2 \\ &= 4 - 12x + 9x^2\end{aligned}$$

D.3 EXPANDING PERFECT CUBE BINOMIALS (ADDITION)

Ex 63: Expand and simplify

$$(x + 1)^3 = \boxed{x^3 + 3x^2 + 3x + 1}$$

Answer: In the perfect cubes expansion, we substitute $a = x$ and $b = 1$:

$$\begin{aligned}(x + 1)^3 &= x^3 + 3 \times x^2 \times 1 + 3 \times x \times 1^2 + 1^3 \\ &= x^3 + 3x^2 + 3x + 1\end{aligned}$$

Ex 64: Expand and simplify

$$(x + 3)^3 = \boxed{x^3 + 9x^2 + 27x + 27}$$

Answer: In the perfect cubes expansion, we substitute $a = x$ and $b = 3$:

$$\begin{aligned}(x + 3)^3 &= x^3 + 3 \times x^2 \times 3 + 3 \times x \times 3^2 + 3^3 \\ &= x^3 + 9x^2 + 27x + 27\end{aligned}$$

Ex 65: Expand and simplify

$$(2x + 2)^3 = \boxed{8x^3 + 24x^2 + 24x + 8}$$

Answer: In the perfect cubes expansion, we substitute $a = 2x$ and $b = 2$:

$$\begin{aligned}(2x + 2)^3 &= (2x)^3 + 3 \times (2x)^2 \times 2 + 3 \times 2x \times (2)^2 + (2)^3 \\ &= 8x^3 + 24x^2 + 24x + 8\end{aligned}$$

Ex 66: Expand and simplify

$$(2x + 3)^3 = \boxed{8x^3 + 36x^2 + 54x + 27}$$

Answer: In the perfect cubes expansion, we substitute $a = 2x$ and $b = 3$:

$$\begin{aligned}(2x + 3)^3 &= (2x)^3 + 3 \times (2x)^2 \times 3 + 3 \times 2x \times (3)^2 + (3)^3 \\ &= 8x^3 + 36x^2 + 54x + 27\end{aligned}$$

D.4 EXPANDING PERFECT CUBE BINOMIALS (SUBTRACTION)

Ex 67: Expand and simplify

$$(x - 1)^3 = \boxed{x^3 - 3x^2 + 3x - 1}$$

Answer: In the perfect cubes expansion, we substitute $a = x$ and $b = (-1)$:

$$\begin{aligned}(x + (-1))^3 &= x^3 + 3 \times x^2 \times (-1) + 3 \times x \times ((-1))^2 + ((-1))^3 \\ &= x^3 - 3x^2 + 3x - 1\end{aligned}$$

Ex 68: Expand and simplify

$$(x - 2)^3 = \boxed{x^3 - 6x^2 + 12x - 8}$$

Answer: In the perfect cubes expansion, we substitute $a = x$ and $b = (-2)$:

$$\begin{aligned}(x + (-2))^3 &= x^3 + 3 \times x^2 \times (-2) + 3 \times x \times (-2)^2 + (-2)^3 \\ &= x^3 - 6x^2 + 12x - 8\end{aligned}$$

Ex 69: Expand and simplify

$$(3 - x)^3 = \boxed{27 - 27x + 9x^2 - x^3}$$

Answer: In the perfect cubes expansion, we substitute $a = 3$ and $b = (-x)$:

$$\begin{aligned}(3 + (-x))^3 &= 3^3 + 3 \times 3^2 \times (-x) + 3 \times 3 \times ((-x))^2 + ((-x))^3 \\ &= 27 - 27x + 9x^2 - x^3\end{aligned}$$

Ex 70: Expand and simplify

$$(2x - 1)^3 = \boxed{8x^3 - 12x^2 + 6x - 1}$$

Answer: In the perfect cubes expansion, we substitute $a = 2x$ and $b = (-1)$:

$$\begin{aligned}(2x + (-1))^3 &= (2x)^3 + 3 \times (2x)^2 \times (-1) + 3 \times 2x \times ((-1))^2 + ((-1 \\ &= 8x^3 - 12x^2 + 6x - 1\end{aligned}$$