

Correction of exercise 1

Simplify the following expressions :

$$\blacktriangleright 1. A = 7 - 1 + 2x - (-9x^2) + x - 9x^2$$

$$A = 2x + 7 - 1 + 9x^2 + x - 9x^2$$

$$A = 9x^2 - 9x^2 + 2x + x + 7 - 1$$

$$A = (9 - 9) \times x^2 + (2 + 1) \times x + 6$$

$$A = 0 + 3x + 6$$

$$A = 3x + 6$$

$$\blacktriangleright 2. B = -9q^2 - 5 - q + 6 - (-4q^2) + 10q$$

$$B = -9q^2 - 5 - q + 6 + 4q^2 + 10q$$

$$B = -9q^2 + 4q^2 - q + 10q - 5 + 6$$

$$B = (-9 + 4) \times q^2 + (-1 + 10) \times q + 1$$

$$B = -5q^2 + 9q + 1$$

$$\blacktriangleright 3. C = 1 - (-3n) + n^2 - 4n + 3n^2 - 6$$

$$C = 1 + 3n + n^2 - 4n + 3n^2 - 6$$

$$C = n^2 + 3n^2 + 3n - 4n + 1 - 6$$

$$C = (1 + 3) \times n^2 + (3 - 4) \times n - 5$$

$$C = 4n^2 - n - 5$$

$$\blacktriangleright 4. D = -6 \times (-2u) \times 6u - (-5u^2) - 8$$

$$D = -6 \times (-2) \times 6 \times u \times u + 5u^2 - 8$$

$$D = 72u^2 + 5u^2 - 8$$

$$D = (72 + 5) \times u^2 - 8$$

$$D = 77u^2 - 8$$

$$\blacktriangleright 5. E = -10t \times (-5) - (-2t^2) + 9t \times 8$$

$$E = -10 \times (-5) \times t + 2t^2 + 9 \times 8 \times t$$

$$E = 50t + 2t^2 + 72t$$

$$E = 2t^2 + 50t + 72t$$

$$E = 2t^2 + (50 + 72) \times t$$

$$E = 2t^2 + 122t$$

$$\blacktriangleright 6. F = -4v \times 6 - 10v^2 - 3v \times (-5)$$

$$F = -4 \times 6 \times v - 10v^2 - (3 \times (-5) \times v)$$

$$F = -24v - 10v^2 - (-15v)$$

$$F = -24v - 10v^2 + 15v$$

$$F = -10v^2 - 24v + 15v$$

$$F = -10v^2 + (-24 + 15) \times v$$

$$F = -10v^2 - 9v$$

$$\blacktriangleright 7. G = -k - (-2k) - 4k^2 - 6 - 6k^2 - 1$$

$$G = -k + 2k - 4k^2 - 6 - 6k^2 - 1$$

$$G = -4k^2 - 6k^2 - k + 2k - 6 - 1$$

$$G = (-4 - 6) \times k^2 + (-1 + 2) \times k - 7$$

$$G = -10k^2 + k - 7$$

$$\blacktriangleright 8. H = -5w^2 - 3w + 2 - 10w^2 - 6w - 1$$

$$H = -5w^2 - 10w^2 - 3w - 6w + 2 - 1$$

$$H = (-5 - 10) \times w^2 + (-3 - 6) \times w + 1$$

$$H = -15w^2 - 9w + 1$$

$$\blacktriangleright 9. I = 2f^2 + 3f + 4f - (-7) - 3f^2 - (-2)$$

$$I = 2f^2 + (3 + 4) \times f + 7 - 3f^2 + 2$$

$$I = 2f^2 + 7f - 3f^2 + 7 + 2$$

$$I = 2f^2 - 3f^2 + 7f + 7 + 2$$

$$I = (2 - 3) \times f^2 + 7f + 9$$

$$I = -f^2 + 7f + 9$$

$$\blacktriangleright 10. J = 2 \times 2 \times (-4v) - 9v^2 - (-2v)$$

$$J = 4 \times (-4) \times v - 9v^2 + 2v$$

$$J = -16v - 9v^2 + 2v$$

$$J = -9v^2 - 16v + 2v$$

$$J = -9v^2 + (-16 + 2) \times v$$

$$J = -9v^2 - 14v$$

$$\blacktriangleright 11. K = -5w^2 + 7 \times 4 \times (-w) \times 5w$$

$$K = -5w^2 + 28 \times (-1) \times 5 \times w \times w$$

$$K = -5w^2 - 140w^2$$

$$K = (-5 - 140) \times w^2$$

$$K = -145w^2$$

$$\blacktriangleright 12. L = 4d \times 9 + d^2 - (-6) \times 7d$$

$$L = 4 \times 9 \times d + d^2 - (-6 \times 7 \times d)$$

$$L = 36d + d^2 - (-42d)$$

$$L = 36d + d^2 + 42d$$

$$L = d^2 + 36d + 42d$$

$$L = d^2 + (36 + 42) \times d$$

$$L = d^2 + 78d$$

►13. $M = 3h + 7h - 4h^2 - 9h^2 + 9 - 9$

$$M = -4h^2 - 9h^2 + 3h + 7h + 9 - 9$$

$$M = (-4 - 9) \times h^2 + (3 + 7) \times h + 0$$

$$M = -13h^2 + 10h + 0$$

$$M = -13h^2 + 10h$$

►14. $N = 2y - 9 - 3y^2 + 3 - (-y^2) - 9y$

$$N = 2y - 9 - 3y^2 + 3 + y^2 - 9y$$

$$N = -3y^2 + y^2 + 2y - 9y - 9 + 3$$

$$N = (-3 + 1) \times y^2 + (2 - 9) \times y - 6$$

$$N = -2y^2 - 7y - 6$$

►15. $O = -5n - (-3n^2) + 4 - 7n + 10 - (-5n^2)$

$$O = -5n + 3n^2 + 4 - 7n + 10 + 5n^2$$

$$O = 3n^2 + 5n^2 - 5n - 7n + 4 + 10$$

$$O = (3 + 5) \times n^2 + (-5 - 7) \times n + 14$$

$$O = 8n^2 - 12n + 14$$

►16. $P = -9 \times x \times 1 - 9x^2 - (-10x)$

$$P = -9x - 9x^2 + 10x$$

$$P = -9x^2 - 9x + 10x$$

$$P = -9x^2 + (-9 + 10) \times x$$

$$P = -9x^2 + x$$

►17. $Q = -9z \times (-1) \times (-2) \times 5z - 2z^2$

$$Q = -9 \times (-1) \times (-2) \times 5 \times z \times z - 2z^2$$

$$Q = -90z^2 - 2z^2$$

$$Q = (-90 - 2) \times z^2$$

$$Q = -92z^2$$

►18. $R = 8 \times (-4f) + 7f^2 - (-10) \times (-5f)$

$$R = 8 \times (-4) \times f + 7f^2 - (-10 \times (-5) \times f)$$

$$R = -32f + 7f^2 - 50f$$

$$R = 7f^2 - 32f - 50f$$

$$R = 7f^2 + (-32 - 50) \times f$$

$$R = 7f^2 - 82f$$

►19. $S = -5 - 4 - (-5y) - 2y - 9y^2 - y^2$

$$S = -9 + 5y - 2y - 9y^2 - y^2$$

$$S = -9y^2 - y^2 + 5y - 2y - 9$$

$$S = (-9 - 1) \times y^2 + (5 - 2) \times y - 9$$

$$S = -10y^2 + 3y - 9$$

►20. $T = 5g - (-10g^2) - (-9g) - 3 + 7g^2 - 10$

$$T = 5g + 10g^2 + 9g - 3 + 7g^2 - 10$$

$$T = 10g^2 + 7g^2 + 5g + 9g - 3 - 10$$

$$T = (10 + 7) \times g^2 + (5 + 9) \times g - 13$$

$$T = 17g^2 + 14g - 13$$

►21. $U = 6 - 3u - u^2 - 3u^2 - 8u + 2$

$$U = -u^2 - 3u^2 - 3u - 8u + 6 + 2$$

$$U = (-1 - 3) \times u^2 + (-3 - 8) \times u + 8$$

$$U = -4u^2 - 11u + 8$$

►22. $V = 6w \times (-4) \times (-1) - 7w^2 - (-5w)$

$$V = 6 \times (-4) \times (-1) \times w - 7w^2 + 5w$$

$$V = 24w - 7w^2 + 5w$$

$$V = -7w^2 + 24w + 5w$$

$$V = -7w^2 + (24 + 5) \times w$$

$$V = -7w^2 + 29w$$

►23. $W = -8 \times (-10) - (-6k^2) - 2k \times (-3k)$

$$W = 80 + 6k^2 - (2 \times (-3) \times k \times k)$$

$$W = 80 + 6k^2 - (-6k^2)$$

$$W = 80 + 6k^2 + 6k^2$$

$$W = 6k^2 + 6k^2 + 80$$

$$W = (6 + 6) \times k^2 + 80$$

$$W = 12k^2 + 80$$

►24. $X = -9u + 8u^2 - 8 \times 1 \times (-4u)$

$$X = -9u + 8u^2 - (8 \times (-4) \times u)$$

$$X = -9u + 8u^2 - (-32u)$$

$$X = -9u + 8u^2 + 32u$$

$$X = 8u^2 - 9u + 32u$$

$$X = 8u^2 + (-9 + 32) \times u$$

$$X = 8u^2 + 23u$$

►25. $Y = -4 - 4w^2 - 6w - 1 + 4w - 2w^2$

$$Y = -4w^2 - 2w^2 - 6w + 4w - 4 - 1$$

$$Y = (-4 - 2) \times w^2 + (-6 + 4) \times w - 5$$

$$Y = -6w^2 - 2w - 5$$

►26. $Z = 7 + v - 6v^2 - 4 - (-2v) - 4v^2$

$$Z = 7 + v - 6v^2 - 4 + 2v - 4v^2$$

$$Z = -6v^2 - 4v^2 + v + 2v + 7 - 4$$

$$Z = (-6 - 4) \times v^2 + (1 + 2) \times v + 3$$

$$Z = -10v^2 + 3v + 3$$

Correction of exercise 2

Simplify the following expressions :

$$\blacktriangleright 1. A = 7f - 9 - 4f^2 - (-10) + 3f + 9f^2$$

$$A = 7f - 9 - 4f^2 + 10 + 3f + 9f^2$$

$$A = -4f^2 + 9f^2 + 7f + 3f - 9 + 10$$

$$A = (-4 + 9) \times f^2 + (7 + 3) \times f + 1$$

$$A = 5f^2 + 10f + 1$$

$$\blacktriangleright 2. B = 9b + 3b^2 - (-9) \times 6b \times (-7)$$

$$B = 9b + 3b^2 - (-9 \times 6 \times (-7) \times b)$$

$$B = 9b + 3b^2 - 378b$$

$$B = 3b^2 + 9b - 378b$$

$$B = 3b^2 + (9 - 378) \times b$$

$$B = 3b^2 - 369b$$

$$\blacktriangleright 3. C = 9 \times (-5z) \times 4z \times (-5) - 10z^2$$

$$C = 9 \times (-5) \times 4 \times (-5) \times z \times z - 10z^2$$

$$C = 900z^2 - 10z^2$$

$$C = (900 - 10) \times z^2$$

$$C = 890z^2$$

$$\blacktriangleright 4. D = 5 \times (-1) \times (-7g) \times (-g) + 10g^2$$

$$D = -5 \times (-7) \times (-1) \times g \times g + 10g^2$$

$$D = -35g^2 + 10g^2$$

$$D = (-35 + 10) \times g^2$$

$$D = -25g^2$$

$$\blacktriangleright 5. E = -5t - 8 + 8t^2 - (-3t) - 7t^2 + 2$$

$$E = -5t - 8 + 8t^2 + 3t - 7t^2 + 2$$

$$E = 8t^2 - 7t^2 - 5t + 3t - 8 + 2$$

$$E = (8 - 7) \times t^2 + (-5 + 3) \times t - 6$$

$$E = t^2 - 2t - 6$$

$$\blacktriangleright 6. F = 6h - 4 - 3h^2 - (-4h^2) - 8h - 2$$

$$F = 6h - 4 - 3h^2 + 4h^2 - 8h - 2$$

$$F = -3h^2 + 4h^2 + 6h - 8h - 4 - 2$$

$$F = (-3 + 4) \times h^2 + (6 - 8) \times h - 6$$

$$F = h^2 - 2h - 6$$

$$\blacktriangleright 7. G = -5d^2 - 2 - (-2d^2) + 6d + 10 - (-10d)$$

$$G = -5d^2 - 2 + 2d^2 + 6d + 10 + 10d$$

$$G = -5d^2 + 2d^2 + 6d + 10d - 2 + 10$$

$$G = (-5 + 2) \times d^2 + (6 + 10) \times d + 8$$

$$G = -3d^2 + 16d + 8$$

$$\blacktriangleright 8. H = -2 + 3v^2 - (-3) \times (-2v) \times 6v$$

$$H = -2 + 3v^2 - (-3 \times (-2) \times 6 \times v \times v)$$

$$H = -2 + 3v^2 - 36v^2$$

$$H = 3v^2 - 36v^2 - 2$$

$$H = (3 - 36) \times v^2 - 2$$

$$H = -33v^2 - 2$$

$$\blacktriangleright 9. I = 2r \times (-7) \times 3r - 2r^2 - 6$$

$$I = 2 \times (-7) \times 3 \times r \times r - 2r^2 - 6$$

$$I = -42r^2 - 2r^2 - 6$$

$$I = (-42 - 2) \times r^2 - 6$$

$$I = -44r^2 - 6$$

$$\blacktriangleright 10. J = 8 \times (-5t) \times 2t \times 6 - (-7t^2)$$

$$J = 8 \times (-5) \times 2 \times 6 \times t \times t + 7t^2$$

$$J = -480t^2 + 7t^2$$

$$J = (-480 + 7) \times t^2$$

$$J = -473t^2$$

$$\blacktriangleright 11. K = -3p + 9 - 6 - 4p^2 - 8p^2 - 8p$$

$$K = -3p + 3 - 4p^2 - 8p^2 - 8p$$

$$K = -4p^2 - 8p^2 - 3p - 8p + 3$$

$$K = (-4 - 8) \times p^2 + (-3 - 8) \times p + 3$$

$$K = -12p^2 - 11p + 3$$

$$\blacktriangleright 12. L = -8 - (-r^2) + 10r - 3 - r + 3r^2$$

$$L = -8 + r^2 + 10r - 3 - r + 3r^2$$

$$L = r^2 + 3r^2 + 10r - r - 8 - 3$$

$$L = (1 + 3) \times r^2 + (10 - 1) \times r - 11$$

$$L = 4r^2 + 9r - 11$$

$$\blacktriangleright 13. M = 6s - 10s - 1 - (-9s^2) + 9s^2 - 6$$

$$M = (6 - 10) \times s - 1 + 9s^2 + 9s^2 - 6$$

$$M = -4s + 9s^2 + 9s^2 - 1 - 6$$

$$M = 9s^2 + 9s^2 - 4s - 1 - 6$$

$$M = (9 + 9) \times s^2 - 4s - 7$$

$$M = 18s^2 - 4s - 7$$

$$\blacktriangleright 14. N = 6 \times (-6a) \times 7a + 7a^2 - (-7)$$

$$N = 6 \times (-6) \times 7 \times a \times a + 7a^2 + 7$$

$$N = -252a^2 + 7a^2 + 7$$

$$N = (-252 + 7) \times a^2 + 7$$

$$N = -245a^2 + 7$$

$$\blacktriangleright 15. O = 4 \times (-8) - (-9w^2) - (-4w) \times (-w)$$

$$O = -32 + 9w^2 - (-4 \times (-1) \times w \times w)$$

$$O = -32 + 9w^2 - 4w^2$$

$$O = 9w^2 - 4w^2 - 32$$

$$O = (9 - 4) \times w^2 - 32$$

$$O = 5w^2 - 32$$

$$\blacktriangleright 16. P = 10t \times 6t - (-9t^2) - 5 \times (-10)$$

$$P = 10 \times 6 \times t \times t + 9t^2 - (-50)$$

$$P = 60t^2 + 9t^2 + 50$$

$$P = (60 + 9) \times t^2 + 50$$

$$P = 69t^2 + 50$$

$$\blacktriangleright 17. Q = 4d^2 - 2 - (-8d^2) - (-2d) - (-8) - 9d$$

$$Q = 4d^2 - 2 + 8d^2 + 2d + 8 - 9d$$

$$Q = 4d^2 + 8d^2 + 2d - 9d - 2 + 8$$

$$Q = (4 + 8) \times d^2 + (2 - 9) \times d + 6$$

$$Q = 12d^2 - 7d + 6$$

$$\blacktriangleright 18. R = 6 - 8g^2 - 4 - (-6g) - 9g^2 - 7g$$

$$R = 6 - 8g^2 - 4 + 6g - 9g^2 - 7g$$

$$R = -8g^2 - 9g^2 + 6g - 7g + 6 - 4$$

$$R = (-8 - 9) \times g^2 + (6 - 7) \times g + 2$$

$$R = -17g^2 - g + 2$$

$$\blacktriangleright 19. S = 2 + 10f - 3f - (-6f^2) - 3 - 8f^2$$

$$S = 2 + 10f - 3f + 6f^2 - 3 - 8f^2$$

$$S = 6f^2 - 8f^2 + 10f - 3f + 2 - 3$$

$$S = (6 - 8) \times f^2 + (10 - 3) \times f - 1$$

$$S = -2f^2 + 7f - 1$$

$$\blacktriangleright 20. T = -f \times 3f \times 7 - (-5f^2) - 6$$

$$T = -1 \times 3 \times 7 \times f \times f + 5f^2 - 6$$

$$T = -21f^2 + 5f^2 - 6$$

$$T = (-21 + 5) \times f^2 - 6$$

$$T = -16f^2 - 6$$

$$\blacktriangleright 21. U = -4b \times 5 \times 8b \times 10 - (-6b^2)$$

$$U = -4 \times 5 \times 8 \times 10 \times b \times b + 6b^2$$

$$U = -1600b^2 + 6b^2$$

$$U = (-1600 + 6) \times b^2$$

$$U = -1594b^2$$

$$\blacktriangleright 22. V = 10 \times (-6k) - (-8k^2) - 7 \times (-10k)$$

$$V = 10 \times (-6) \times k + 8k^2 - (7 \times (-10) \times k)$$

$$V = -60k + 8k^2 - (-70k)$$

$$V = -60k + 8k^2 + 70k$$

$$V = 8k^2 - 60k + 70k$$

$$V = 8k^2 + (-60 + 70) \times k$$

$$V = 8k^2 + 10k$$

$$\blacktriangleright 23. W = -6 - (-6g) - 10g - 9 - 7g^2 + 5g^2$$

$$W = -6 + 6g - 10g - 9 - 7g^2 + 5g^2$$

$$W = -7g^2 + 5g^2 + 6g - 10g - 6 - 9$$

$$W = (-7 + 5) \times g^2 + (6 - 10) \times g - 15$$

$$W = -2g^2 - 4g - 15$$

$$\blacktriangleright 24. X = -10s^2 - 3 - 9 - (-4s^2) - (-6s) + 4s$$

$$X = -10s^2 - 12 + 4s^2 + 6s + 4s$$

$$X = -10s^2 + 4s^2 + 6s + 4s - 12$$

$$X = (-10 + 4) \times s^2 + (6 + 4) \times s - 12$$

$$X = -6s^2 + 10s - 12$$

$$\blacktriangleright 25. Y = -5g^2 + 3g^2 - 9g - 4 - 10g + 5$$

$$Y = (-5 + 3) \times g^2 - 9g - 4 - 10g + 5$$

$$Y = -2g^2 - 9g - 10g - 4 + 5$$

$$Y = -2g^2 + (-9 - 10) \times g + 1$$

$$Y = -2g^2 - 19g + 1$$

$$\blacktriangleright 26. Z = -2n^2 - 3 \times 9n \times 2 \times (-9n)$$

$$Z = -2n^2 - (3 \times 9 \times 2 \times (-9) \times n \times n)$$

$$Z = -2n^2 - (-486n^2)$$

$$Z = -2n^2 + 486n^2$$

$$Z = (-2 + 486) \times n^2$$

$$Z = 484n^2$$

Correction of exercise 3

Simplify the following expressions :

$$\blacktriangleright 1. A = 8 \times 5v \times (-v) \times (-9) - (-5v^2)$$

$$A = 8 \times 5 \times (-1) \times (-9) \times v \times v + 5v^2$$

$$A = 360v^2 + 5v^2$$

$$A = (360 + 5) \times v^2$$

$$A = 365v^2$$

$$\blacktriangleright 2. B = -6 \times (-3m) \times 7 \times 6m - 8m^2$$

$$B = -6 \times (-3) \times 7 \times 6 \times m \times m - 8m^2$$

$$B = 756m^2 - 8m^2$$

$$B = (756 - 8) \times m^2$$

$$B = 748m^2$$

$$\blacktriangleright 3. C = 8s + s^2 + 1 + 4 - 5s - 6s^2$$

$$C = s^2 + 8s + 1 + 4 - 5s - 6s^2$$

$$C = s^2 - 6s^2 + 8s - 5s + 1 + 4$$

$$C = (1 - 6) \times s^2 + (8 - 5) \times s + 5$$

$$C = -5s^2 + 3s + 5$$

$$\blacktriangleright 4. D = -1 - 7h^2 - 6 - 6h - 8h^2 + h$$

$$D = -7h^2 - 8h^2 - 6h + h - 1 - 6$$

$$D = (-7 - 8) \times h^2 + (-6 + 1) \times h - 7$$

$$D = -15h^2 - 5h - 7$$

$$\blacktriangleright 5. E = 6 - 5r - (-10r^2) - 10 - 9r - 8r^2$$

$$E = 6 - 5r + 10r^2 - 10 - 9r - 8r^2$$

$$E = 10r^2 - 8r^2 - 5r - 9r + 6 - 10$$

$$E = (10 - 8) \times r^2 + (-5 - 9) \times r - 4$$

$$E = 2r^2 - 14r - 4$$

$$\blacktriangleright 6. F = 8 \times 6f - (-9f^2) - 5 \times (-f)$$

$$F = 8 \times 6 \times f + 9f^2 - 5 \times (-1) \times f$$

$$F = 48f + 9f^2 - (-5f)$$

$$F = 48f + 9f^2 + 5f$$

$$F = 9f^2 + 48f + 5f$$

$$F = 9f^2 + (48 + 5) \times f$$

$$F = 9f^2 + 53f$$

$$\blacktriangleright 7. G = 9 \times (-6r) + 10r^2 + 3r \times (-6)$$

$$G = 9 \times (-6) \times r + 10r^2 + 3 \times (-6) \times r$$

$$G = -54r + 10r^2 - 18r$$

$$G = 10r^2 - 54r - 18r$$

$$G = 10r^2 + (-54 - 18) \times r$$

$$G = 10r^2 - 72r$$

$$\blacktriangleright 8. H = -2r \times (-10r) \times (-10) - (-5r^2) + 5$$

$$H = -2 \times (-10) \times (-10) \times r \times r + 5r^2 + 5$$

$$H = -200r^2 + 5r^2 + 5$$

$$H = (-200 + 5) \times r^2 + 5$$

$$H = -195r^2 + 5$$

Correction of exercise 4

Expand the following expressions :

$$A = (8x - 4)(7x + 4)$$

$$A = 56x^2 + 32x + (-28x) + (-16)$$

$$A = 56x^2 + 4x - 16$$

$$B = (2x - 3)(2x - 5)$$

$$B = 4x^2 + (-10x) + (-6x) + 15$$

$$B = 4x^2 - 16x + 15$$

$$C = (-10x - 9)(-8x - 10)$$

$$C = 80x^2 + 100x + 72x + 90$$

$$C = 80x^2 + 172x + 90$$

$$D = (-5x + 8)(-8x + 9)$$

$$D = 40x^2 + (-45x) + (-64x) + 72$$

$$D = 40x^2 - 109x + 72$$

$$E = (-4x + 7)(-3x + 2)$$

$$E = 12x^2 + (-8x) + (-21x) + 14$$

$$E = 12x^2 - 29x + 14$$

$$F = (-8x - 6)(-8x - 2)$$

$$F = 64x^2 + 16x + 48x + 12$$

$$F = 64x^2 + 64x + 12$$

$$G = (-4x + 5)(3x + 5)$$

$$G = -12x^2 + (-20x) + 15x + 25$$

$$G = -12x^2 - 5x + 25$$

$$H = (5x + 4)(-2x - 4)$$

$$H = -10x^2 + (-20x) + (-8x) + (-16)$$

$$H = -10x^2 - 28x - 16$$

$$I = (2x + 1)(x - 3)$$

$$I = 2x^2 + (-6x) + x + (-3)$$

$$I = 2x^2 - 5x - 3$$

$$J = (-9x + 9)(-4x - 6)$$

$$J = 36x^2 + 54x + (-36x) + (-54)$$

$$J = 36x^2 + 18x - 54$$

$$K = (-7x + 9)(2x - 5)$$

$$K = -14x^2 + 35x + 18x + (-45)$$

$$K = -14x^2 + 53x - 45$$

$$L = (-6x + 1)(8x + 2)$$

$$L = -48x^2 + (-12x) + 8x + 2$$

$$L = -48x^2 - 4x + 2$$

$$M = (-2x + 1)(9x + 6)$$

$$M = -18x^2 + (-12x) + 9x + 6$$

$$M = -18x^2 - 3x + 6$$

$$N = (7x - 5)(8x + 2)$$

$$N = 56x^2 + 14x + (-40x) + (-10)$$

$$N = 56x^2 - 26x - 10$$

$$O = (-9x + 2)(-5x + 10)$$

$$O = 45x^2 + (-90x) + (-10x) + 20$$

$$O = 45x^2 - 100x + 20$$

$$P = (-10x + 8)(-9x + 1)$$

$$P = 90x^2 + (-10x) + (-72x) + 8$$

$$P = 90x^2 - 82x + 8$$

$$Q = (6x + 5)(3x + 4)$$

$$Q = 18x^2 + 24x + 15x + 20$$

$$Q = 18x^2 + 39x + 20$$

$$R = (7x + 6)(-10x + 10)$$

$$R = -70x^2 + 70x + (-60x) + 60$$

$$R = -70x^2 + 10x + 60$$

$$S = (2x + 2)(-5x + 1)$$

$$S = -10x^2 + 2x + (-10x) + 2$$

$$S = -10x^2 - 8x + 2$$

$$T = (9x + 10)(7x + 8)$$

$$T = 63x^2 + 72x + 70x + 80$$

$$T = 63x^2 + 142x + 80$$

$$U = (-8x - 8)(9x - 1)$$

$$U = -72x^2 + 8x + (-72x) + 8$$

$$U = -72x^2 - 64x + 8$$

$$V = (5x + 9)(-9x - 3)$$

$$V = -45x^2 + (-15x) + (-81x) + (-27)$$

$$V = -45x^2 - 96x - 27$$

$$W = (-2x + 9)(7x - 3)$$

$$W = -14x^2 + 6x + 63x + (-27)$$

$$W = -14x^2 + 69x - 27$$

$$X = (8x - 4)(-x - 10)$$

$$X = -8x^2 + (-80x) + 4x + 40$$

$$X = -8x^2 - 76x + 40$$

$$Y = (9x + 10)(-9x - 7)$$

$$Y = -81x^2 + (-63x) + (-90x) + (-70)$$

$$Y = -81x^2 - 153x - 70$$

$$Z = (-4x - 2)(5x - 1)$$

$$Z = -20x^2 + 4x + (-10x) + 2$$

$$Z = -20x^2 - 6x + 2$$

Correction of exercise 5

Expand the following expressions :

$$A = (x + 6)(-x + 8)$$

$$A = -x^2 + 8x + (-6x) + 48$$

$$A = -x^2 + 2x + 48$$

$$B = (5x - 8)(10x - 5)$$

$$B = 50x^2 + (-25x) + (-80x) + 40$$

$$B = 50x^2 - 105x + 40$$

$$C = (-6x - 5)(-5x + 8)$$

$$C = 30x^2 + (-48x) + 25x + (-40)$$

$$C = 30x^2 - 23x - 40$$

$$D = (-4x - 5)(10x - 6)$$

$$D = -40x^2 + 24x + (-50x) + 30$$

$$D = -40x^2 - 26x + 30$$

$$E = (8x + 8)(-10x + 7)$$

$$E = -80x^2 + 56x + (-80x) + 56$$

$$E = -80x^2 - 24x + 56$$

$$F = (9x + 5)(-3x + 1)$$

$$F = -27x^2 + 9x + (-15x) + 5$$

$$F = -27x^2 - 6x + 5$$

$$G = (2x - 5)(3x - 6)$$

$$G = 6x^2 + (-12x) + (-15x) + 30$$

$$G = 6x^2 - 27x + 30$$

$$H = (-3x + 8)(9x + 7)$$

$$H = -27x^2 + (-21x) + 72x + 56$$

$$H = -27x^2 + 51x + 56$$

$$I = (8x + 2)(-x + 9)$$

$$I = -8x^2 + 72x + (-2x) + 18$$

$$I = -8x^2 + 70x + 18$$

$$J = (2x - 6)(-10x + 6)$$

$$J = -20x^2 + 12x + 60x + (-36)$$

$$J = -20x^2 + 72x - 36$$

$$K = (2x - 7)(10x + 4)$$

$$K = 20x^2 + 8x + (-70x) + (-28)$$

$$K = 20x^2 - 62x - 28$$

$$L = (x + 8)(-10x - 4)$$

$$L = -10x^2 + (-4x) + (-80x) + (-32)$$

$$L = -10x^2 - 84x - 32$$

$$M = (-10x - 7)(-5x + 1)$$

$$M = 50x^2 + (-10x) + 35x + (-7)$$

$$M = 50x^2 + 25x - 7$$

$$N = (-10x - 3)(-6x + 1)$$

$$N = 60x^2 + (-10x) + 18x + (-3)$$

$$N = 60x^2 + 8x - 3$$

$$O = (2x + 3)(-3x + 2)$$

$$O = -6x^2 + 4x + (-9x) + 6$$

$$O = -6x^2 - 5x + 6$$

$$P = (6x - 1)(-9x - 8)$$

$$P = -54x^2 + (-48x) + 9x + 8$$

$$P = -54x^2 - 39x + 8$$

$$Q = (-8x + 1)(8x - 3)$$

$$Q = -64x^2 + 24x + 8x + (-3)$$

$$Q = -64x^2 + 32x - 3$$

$$R = (4x + 8)(-6x - 7)$$

$$R = -24x^2 + (-28x) + (-48x) + (-56)$$

$$R = -24x^2 - 76x - 56$$

$$S = (-6x - 4)(-10x - 5)$$

$$S = 60x^2 + 30x + 40x + 20$$

$$S = 60x^2 + 70x + 20$$

$$T = (-6x - 8)(-7x - 2)$$

$$T = 42x^2 + 12x + 56x + 16$$

$$T = 42x^2 + 68x + 16$$

$$U = (3x - 9)(-6x + 3)$$

$$U = -18x^2 + 9x + 54x + (-27)$$

$$U = -18x^2 + 63x - 27$$

$$V = (10x + 1)(-3x - 7)$$

$$V = -30x^2 + (-70x) + (-3x) + (-7)$$

$$V = -30x^2 - 73x - 7$$

$$W = (-3x + 3)(3x - 9)$$

$$W = -9x^2 + 27x + 9x + (-27)$$

$$W = -9x^2 + 36x - 27$$

$$X = (-3x - 4)(-6x - 8)$$

$$X = 18x^2 + 24x + 24x + 32$$

$$X = 18x^2 + 48x + 32$$

$$Y = (9x + 2)(-10x - 9)$$

$$Y = -90x^2 + (-81x) + (-20x) + (-18)$$

$$Y = -90x^2 - 101x - 18$$

$$Z = (-4x + 2)(-2x + 10)$$

$$Z = 8x^2 + (-40x) + (-4x) + 20$$

$$Z = 8x^2 - 44x + 20$$

Correction of exercise 6

Expand the following expressions :

$$A = (-6x + 7)(9x + 9)$$

$$A = -54x^2 + (-54x) + 63x + 63$$

$$A = -54x^2 + 9x + 63$$

$$B = (9x + 8)(-6x - 1)$$

$$B = -54x^2 + (-9x) + (-48x) + (-8)$$

$$B = -54x^2 - 57x - 8$$

$$C = (4x + 5)(3x + 9)$$

$$C = 12x^2 + 36x + 15x + 45$$

$$C = 12x^2 + 51x + 45$$

$$D = (7x - 4)(-9x + 9)$$

$$D = -63x^2 + 63x + 36x + (-36)$$

$$D = -63x^2 + 99x - 36$$

$$E = (5x - 3)(10x - 8)$$

$$E = 50x^2 + (-40x) + (-30x) + 24$$

$$E = 50x^2 - 70x + 24$$

$$F = (8x - 2)(-10x - 10)$$

$$F = -80x^2 + (-80x) + 20x + 20$$

$$F = -80x^2 - 60x + 20$$

$$G = (10x + 4)(x + 8)$$

$$G = 10x^2 + 80x + 4x + 32$$

$$G = 10x^2 + 84x + 32$$

$$H = (-6x + 10)(-10x + 3)$$

$$H = 60x^2 + (-18x) + (-100x) + 30$$

$$H = 60x^2 - 118x + 30$$