**Simplify the following expressions.**

       1)   (2x - 3y + 4z) + (9x - 8y + 7z)

 2) (5m + 2n - 6) - (3m - 2n + 4)

 3) Subtract the quantity 12a2 - 8a + 4 from the quantity 12 - 7a2

 4) $12\left(\frac{1}{3} x – \frac{1}{4} y\right)$ $-$ $\left(\frac{2}{5} x + \frac{1}{2} y\right)$ + $6\left(\frac{3}{10} x - \frac{2}{3} y\right)$

 5) (3m2 + 9mn + 3n2) - 6(2n2 - 5m2) + 2(12m2 + 9mn - 3n2)

  6)    (7.4a - 2.3b + c) + 10(2.6a - 2.3b + 4.5c) - 3(a + b + c)

 7)     Subtract four times the quantity 2x + 5 from three times the quantity 7x – 8

 8)      Multiply the quantity 2x2 – 8xy + 5y3 by (-5) and add that product to the quantity
 7x2 – 8xy + 3y2

 9)   Subtract the quantity 10x + 5y – 4z from the sum of the quantities 7z + 3y – 10x
 and 9x – 12y – z

 10)   Subtract six times the quantity 3a + 12b – 4c from eight times the sum of the quantities
 14a + 7c and 5b – 12c

**Write an algebraic expression to the given verbal expression**

1. the product of twice *a* and *b*
2. twice the product of *a* and *b*
3. two less than five times a number
4. twice a number increased by three times the number
5. the sum of 3 times *a* and *b*
6. three times the sum of *a* and *b*

**Simplify the following expressions.**

       1)   (2x - 3y + 4z) + (9x - 8y + 7z)

11x – 11y + 11z

 2) (5m + 2n - 6) - (3m - 2n + 4)

 2m + 4n – 10

 3) Subtract the quantity 12a2 - 8a + 4 from the quantity 12 - 7a2

    (12 – 7a2) – (12a2 – 8a + 4)

 -19a2 + 8a + 8

 4)   $12\left(\frac{1}{3} x – \frac{1}{4} y\right)$ $-$ $\left(\frac{2}{5} x + \frac{1}{2} y\right)$ + $6\left(\frac{3}{10} x - \frac{2}{3} y\right)$

 $4x-3y-\frac{2}{5}x-\frac{1}{2}y+\frac{9}{5}x-4y$

 $\frac{20x - 2x + 9x}{5}+\frac{-6y- y - 8y}{2}$

 $\frac{27}{5}x$ – $\frac{15}{2}y$

  5) (3m2 + 9mn + 3n2) - 6(2n2 - 5m2) + 2(12m2 + 9mn - 3n2)

 3m2 + 9mn + 3n2 – 12n2 + 30m2 + 24m2 + 18mn – 6n2

 57m2 + 27mn – 15n2

  6)    (7.4a - 2.3b + c) + 10(2.6a - 2.3b + 4.5c) - 3(a + b + c)

 7.4a – 2.3b + c + 26a – 23b + 45c $-$ 3a – 3b $-$ 3c

 30.4a – 28.3b + 43c

 7)    Subtract four times the quantity 2x + 5 from three times the quantity 7x – 8

 (7x – 8) – 4(2x + 5)

 x – 28

 8)   Multiply the quantity 2x2 – 8xy + 5y3 by (-5) and add that product to the quantity 7x2 – 8xy + 3y2.

 $-$5(2x2 – 8xy + 5y3) + (7x2 – 8xy + 3y2)

 $-$10 x2 + 8xy $-$ 25 y3 + 7x2 – 8xy + 3y2

 $-$3x2 + 32xy – 25y3 + 3y2

9)   Subtract the quantity 10x + 5y – 4z from the sum of the quantities 7z + 3y – 10x
and 9x – 12y – z

(7z + 3y – 10x + 9x – 12y – z) – (10x + 5y – 4z)

 7z + 3y – 10x + 9x – 12y – z $–$ 10x – 5y + 4z

 10z – 14y – 11x

10)   Subtract six times the quantity 3a + 12b – 4c from eight times the sum of the quantities
14a + 7c and 5b – 12c

8(14a + 7c + 5b – 12c) – 6(3a + 12b – 4c)

112a + 56c + 40b – 96c – 18a – 72b + 24c

94a – 16c – 32b

 **Write an algebraic expression to the given verbal expression**

1. the product of twice *a* and *b*

2a × b

1. twice the product of *a* and *b*

2×(a×b)

1. two less than five times a number

5n - 2

1. twice a number increased by three times the number

2n + 3n

1. the sum of 3 times *a* and *b*

3a + b

1. three times the sum of *a* and *b*

3(a + b)