

DAY 2 - Multiplying Polynomials

Expand and simplify

1. a) $(2x + 1)(3x + 7)$

$$6x^2 + 14x + 3x + 7$$

$$6x^2 + 17x + 7$$

b) $(3x - 4)(3x + 5)$

$$9x^2 + 15x - 12x - 20$$

$$9x^2 + 3x - 20$$

c) $(5x + 3)(x - 2)$

$$5x^2 - 10x + 3x - 6$$

$$5x^2 - 7x - 6$$

2. a) $(2x + 1)^2(2x + 1)$

$$= 4x^2 + 2x + 2x + 1$$

$$= 4x^2 + 4x + 1$$

b) $(4x - 1)^2(4x - 1)$

$$= 16x^2 - 4x - 4x + 1$$

$$= 16x^2 - 8x + 1$$

c) $(3x + 2)^2(3x + 2)$

$$9x^2 + 6x + 6x + 4$$

$$9x^2 + 12x + 4$$

Expand and simplify the expression

3. $(2x - 3)(3x - 2)$

$$6x^2 - 4x - 9x + 6$$

$$6x^2 - 13x + 6$$

4. $(5x - 2)^2(5x - 2)$

$$25x^2 - 10x - 10x + 4$$

$$25x^2 - 20x + 4$$

5. $(x + 3)(x + 7) - (x + 5)^2(x + 5)$

$$= (x^2 + 3x + 7x + 21) - (x^2 + 5x + 5x + 25)$$

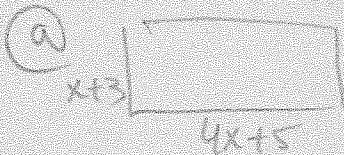
$$= x^2 + 10x + 21 - x^2 - 10x - 25$$

$$= -4$$

6. A two-lane bridge has width $x + 3$ and length $4x + 5$.

a) Sketch a rectangle with these dimensions.

b) Find a quadratic expression that represents the area of the bridge.



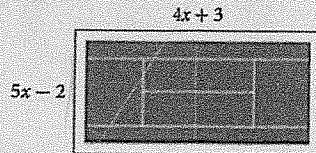
b)

$$A = (x + 3)(4x + 5)$$

$$= 4x^2 + 5x + 12x + 15$$

$$= 4x^2 + 17x + 15$$

7. A tennis club is redesigning its court area. They want to add several new courts and some benches for waiting players.



a) Write a quadratic expression to represent the total court area.

b) The club plans to place a fence around the court area.

Write an expression for the perimeter of the court area to determine how much fencing will be required.

a)

$$A = (5x - 2)(4x + 3)$$

$$= 20x^2 + 15x - 8x - 6$$

$$= 20x^2 + 7x - 6$$

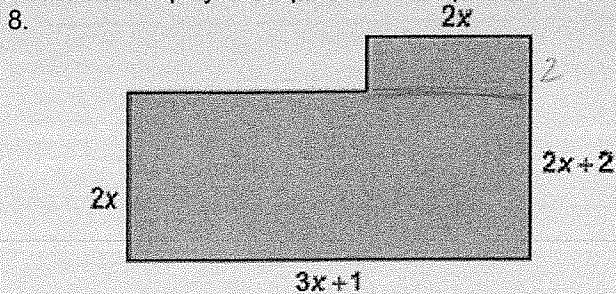
b)

$$P = 2(4x + 3) + 2(5x - 2)$$

$$= 8x + 6 + 10x - 4$$

$$= 18x + 2$$

Write and simplify an expression to represent the area of each shaded region.

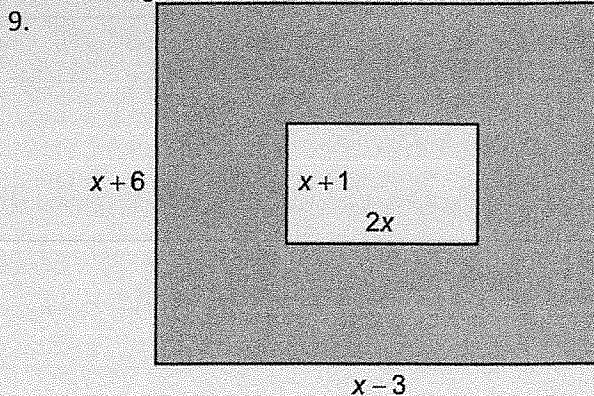


1/3

$$A = 2(2x) + (2x)(3x+1)$$

$$= 4x + 6x^2 + 2x$$

$$= 6x^2 + 6x$$



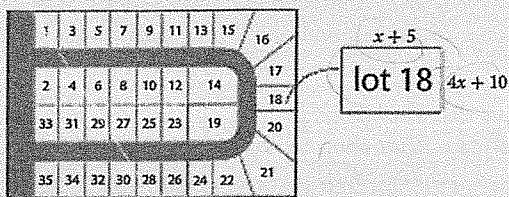
$$A = (x+6)(x-3) - (2x)(x+1)$$

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

$$= -x^2 + 1x - 18$$

1/3

10. A builder is developing a site for a new subdivision with extra-long lots. Dmitri plans to buy lot 18.
- Find an expression to represent the area of lot 18.
 - If $x = 35$ ft, find the actual area of lot 18.
 - According to city by-laws, houses are only permitted to occupy 40% of their lots. What is the maximum area that Dmitri's house can occupy? Check with your local by-law department to see if the 40% rule applies in your area.



1/5

$$A = (x+5)(4x+10)$$

$$= 4x^2 + 10x + 20x + 50$$

$$= 4x^2 + 30x + 50$$

$$b) A = 4(35)^2 + 30(35) + 50$$

$$= 4(1225) + 1050 + 50$$

$$= 4900 + 1100$$

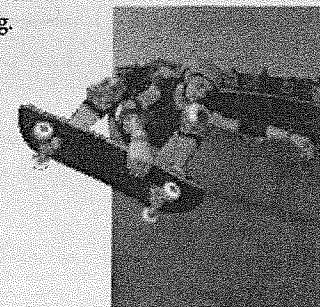
$$= 6000 \text{ ft}^2$$

$$c) 0.40(6000)$$

$$= 2400 \text{ ft}^2 \text{ units}$$

16

11. A public skateboard park is $x + 3$ units wide and $2x - 6$ units long.
- Write a quadratic expression to represent the area of the skateboard park.
 - If $x = 11$ m, calculate the actual area of the skateboard park in square metres.
 - If concrete resurfacing costs $\$4.99/\text{m}^2$, calculate the cost of resurfacing the skateboard park.



$$a) A = (x+3)(2x-6)$$

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

$$= 2x^2 - 18$$

$$b) A = 2(11)^2 - 18$$

$$= 2(121) - 18$$

$$= 242 - 18$$

$$= 224 \text{ m}^2$$

1/5

$$c) \$ 4.99 (224 \text{ m}^2)$$

$$= \$ 1117.76$$