Topic: Factoring the difference of two squares

Question: Factor the binomial.

$$x^2 - 4$$

Answer choices:

A $x + 2$

B $(x + 2)(x - 2)$

C $(x + 2)(x + 2)$

D $(x - 2)(x - 2)$

Solution: B

We have the difference of perfect squares because $x^2 = (x)^2$ and $4 = (2)^2$.

Therefore, $x^2 - 4$ is factored as

$$(x + 2)(x - 2)$$

Topic: Factoring the difference of two squares

Question: Factor the binomial.

$$81x^2y^2 - 16t^6$$

Answer choices:

A $(9xy + 4t^3)(9xy + 4t^3)$

B $(9xy + 4t^2)(9xy - 4t^4)$

C $(9xy + 4t^3)(9xy - 4t^3)$

D $(9xy + 4t^2)(9xy - 4t^2)$

Solution: C

If we start with

$$81x^2y^2 - 16t^6$$

we see that $81x^2y^2 = (9xy)^2$ and $16t^6 = (4t)^3$.

Knowing the pattern for factoring the difference of two squares, we factor $81x^2y^2 - 16t^6$ as

$$(9xy + 4t^3)(9xy - 4t^3)$$

We can check our work by using the FOIL method.

$$(9xy + 4t^3)(9xy - 4t^3)$$

$$81x^2y^2 - 36t^3xy + 36t^3xy - 16t^6$$

$$81x^2y^2 - 16t^6$$

Topic: Factoring the difference of two squares

Question: Factor the binomial.

$$25r^4z^2 - 225a^4b^{10}$$

Answer choices:

A $(5r^2z + 15a^2b^5)(5r^2z - 15a^2b^5)$

B $(5r^2z - 25a^2b^5)(5r^2z - 25a^2b^5)$

C $(5r^2z + 15a^3b^2)(5r^2z - 15a^1b^5)$

D $(5r^2z + 25a^2b^5)(5r^2z - 25a^2b^5)$

Solution: A

If we start with

$$25r^4z^2 - 225a^4b^{10}$$

we can say that the square root of $25r^4z^2$ is $5r^2z$, and the square root of $225a^4b^{10}$ is $15a^2b^5$.

Knowing the pattern for factoring the difference of two squares, we can write these factors:

$$(5r^2z + 15a^2b^5)(5r^2z - 15a^2b^5)$$

We can check our work by using the FOIL method.

$$(5r^2z + 15a^2b^5)(5r^2z - 15a^2b^5)$$

$$25r^4z^2 - 75a^2b^5r^2z + 75a^2b^5r^2z - 225a^4b^{10}$$

$$25r^4z^2 - 225a^4b^{10}$$