Topic: Greatest common factor of trinomials

Question: Factor out the greatest common factor.

$$2x + 4xy + 10bx$$

Answer choices:

A $2(x + 2xy + 5bx)$

B $2x(1 + 2y + 5b)$

C $2x(2y + 5b)$

D $2xy(3 + 5b)$

Solution: B

We can see that all of our coefficients are even whole numbers (provided that b is a whole number), so we can factor out a 2.

$$2x + 4xy + 10bx$$

$$2(x + 2xy + 5bx)$$

Since there's still an x which is common to all the terms, we can factor that out also.

$$2x(1 + 2y + 5b)$$

Since there's no factor that's common to 1 and $2y$ and $5b$, we know we're done factoring, and that the greatest common factor is $2x$.

Topic: Greatest common factor of trinomials

Question: Factor out the greatest common factor.

$$2xy + 4x^2y^2 + 8x^3y^3$$

Answer choices:

A $2xy(1 + 2xy + 4x^2y^2)$

B $2xy(2xy + 4xy^2)$

C $2x(y + 2xy)$

D $2xy(2 + 2x + 4xy)$

Solution: A

We can see that all of our coefficients are even whole numbers, so we can factor out a 2.

$$2xy + 4x^2y^2 + 8x^3y^3$$

$$2(xy + 2x^2y^2 + 4x^3y^3)$$

Since there's still an x which is common to all the terms, we can factor that out also.

$$2x(y + 2xy^2 + 4x^2y^3)$$

And since there's still a y which is common to all the terms, we can factor that out as well.

$$2xy(1 + 2xy + 4x^2y^2)$$

Notice that we've factored everything from the first term, but that the first term doesn't become 0; we have to leave a 1 to account for it.

Since there's no factor that's common to 1 and $2xy$ and $4x^2y^2$, we know we're done factoring, and that the greatest common factor is $2xy$.

Topic: Greatest common factor of trinomials

Question: Factor out the greatest common factor.

$$6t^4x - 3t^3x - 45t^2x$$

Answer choices:

A $(3t^2x)(2t^2 - t - 15)$

B $(3t^2x)(2t^2 + t - 15)$

C $(3tx)(2t^4 - 7t^2 - 15)$

D $(3tx)(2t^4 - t^2 - 15)$

Solution: A

If we start with

$$6t^4x - 3t^3x - 45t^2x$$

and look for common factors, we can see that

- 3 is the largest common integer factor.
- t^2 is the largest power of t that is a common factor.
- x is the largest power of x that is a common factor.

Putting them together gives a GCF of $3t^2x$. Factoring out the $3t^2x$ gives

$$(3t^2x)(2t^2 - t - 15)$$