Topic: Multivariable equations

Question: Solve for z.

$$3y - 4x + 2z = 6$$

Answer choices:

A $z = \dfrac{2}{6 + 2x - 3y}$

B $z = \dfrac{6 + 4x - 3y}{2}$

C $z = x - 4$

D $z = 5 + x + 6y$

Solution: B

We need to get z by itself on one side of the equation. Move the $3y$ first.

$$3y - 4x + 2z = 6$$

$$3y - 3y - 4x + 2z = 6 - 3y$$

$$-4x + 2z = 6 - 3y$$

Now move the $-4x$.

$$-4x + 4x + 2z = 6 + 4x - 3y$$

$$2z = 6 + 4x - 3y$$

Divide by 2 to solve for z.

$$\frac{2z}{2} = \frac{6 + 4x - 3y}{2}$$

$$z = \frac{6 + 4x - 3y}{2}$$

Topic: Multivariable equations

Question: Solve for z.

$$2y - 3x - z = 7x$$

Answer choices:

A $z = 10x + 2y$

B $z = 10x - 2y$

C $z = 2y - 10x$

D $z = -10x - 2y$

Solution: C

We need to get z by itself on one side of the equation. Move the $-3x$ first.

$$2y - 3x - z = 7x$$

$$2y - 3x + 3x - z = 7x + 3x$$

$$2y - z = 10x$$

Now move the $2y$.

$$2y - 2y - z = 10x - 2y$$

$$-z = 10x - 2y$$

Multiply by -1.

$$(-z)(-1) = (10x - 2y)(-1)$$

$$z = -10x + 2y$$

$$z = 2y - 10x$$

Topic: Multivariable equations

Question: Solve for z.

$$3x - y + 2z = 12$$

Answer choices:

A $\dfrac{12 - 3x + y}{2}$

B $\dfrac{12 + 3x - y}{2}$

C $12 - 3x + y$

D $12 + 3x - y$

Solution: A

Move the $3x$ and the $-y$.

$$3x - y + 2z = 12$$

$$3x - y + 2z - 3x + y = 12 - 3x + y$$

$$2z = 12 - 3x + y$$

Divide both sides by 2.

$$z = \frac{12 - 3x + y}{2}$$