

SAT

$$x^2 + 6x + 9 \quad 4x^2 + 24x + 36$$

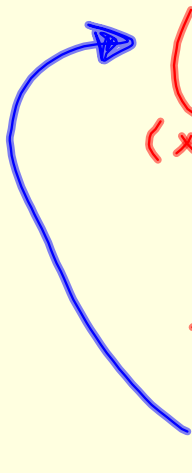
If $y = (x + 3)^2$, then $(-2x - 6)^2$ must equal which of the following?

- (A) $-4y^2$
- (B) $-2y^2$
- (C) $-4y$
- (D) $2y$
- (E) $4y$

1-5 Solving Quadratic Functions:
Day 2- Completing the Square

Write the quadratic equation in standard form...

$$(x + 12)^2 = 18$$


$$(x + 12)^2 - 18 = 0$$

$(x + 12)(x + 12)$

$$x^2 + 24x + 144 - 18 = 0$$

$$* x^2 + 24x + 126 = 0$$

What is a perfect square trinomial?

$$x^2 - 6x + \cancel{7}9 - 2$$

Is this a perfect square trinomial??

It is NOT a perfect square trinomial because it has that 7 instead of 9.

But $7 = 9 - 2$ so we can rewrite this as

$$x^2 - 6x + 9 - 2 = (x - 3)^2 - 2$$

Completing the Square

Complete the square to find the vertex in the form $f(x) = a(x - h)^2 + k$

a) What would we add to complete each square? $(\frac{10}{2})^2 \rightarrow$

$$x^2 + 8x + \underline{16} = (x+4)^2 \quad x^2 - 10x + \underline{25} = (x-5)^2$$

$$x^2 + 7x + \underline{(\frac{7}{2})^2}$$

$$= (x + \frac{7}{2})^2$$

$$x^2 + 2ax + \underline{a^2}$$

$$(\frac{2a}{2})^2 \rightarrow = (x+a)^2$$

$$x = \frac{-b}{2a}$$

$$= \frac{-14}{2(1)} = -7$$

Completing the Square

Complete the square to find the vertex in the form $f(x) = a(x - h)^2 + k$

$$1. f(x) = x^2 + 14x - 3$$

$$\left[x^2 + 14x + \boxed{7^2} \right] - 3 - \boxed{7^2}$$

$$(x^2 + 14x + 49) - 3 - 49$$

$$f(x) = (x + 7)^2 - 52$$

$$\text{Vertex: } (-7, -52)$$

Now do Practice #2...

Completing the Square

Complete the square to find the vertex in the
form $f(x) = a(x - h)^2 + k$

3. $f(x) = 2x^2 - 8x + 7$

$$\left[2x^2 - 8x + \boxed{} \right] + 7 - \boxed{}$$

$$2 \left[x^2 - 4x + \boxed{4} \right] + 7 - \boxed{8}$$

$$f(x) = 2(x - 2)^2 - 1$$

$$\text{Vertex: } (2, -1)$$

Now do Practice #4...

Homework Assignment
WS 1-5 Completing the Square
(1-11 all)