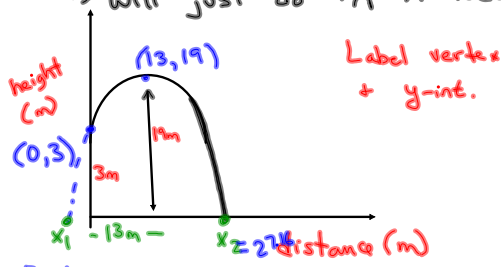


Functions → Word Problems

→ Will just do Type A today...



What do we need to find?

**NEW**  
Formula for Parabola:

$$y = a(x-h)^2 + k$$

Annotations: (0,3) is labeled as x, y. (13,19) is labeled as h, k.

Use when you know vertex (h, k) & one point (x, y)

$$3 = a(0-13)^2 + 19$$

$$3 = a(-13)^2 + 19$$

$$3 = 169a + 19$$

$$-169a = 19 - 3$$

$$\frac{-169a}{-169} = \frac{16}{-169}$$

$$a = -0.095$$

Put "a", "h" + "k" back into:

$$y = a(x-h)^2 + k$$

$$y = -0.095(x-13)^2 + 19$$

Let y=0 to find x-ints

$$0 = -0.095(x-13)(x-13) + 19$$

$$0 = -0.095(x^2 - 26x + 169) + 19$$

$$0 = -0.095x^2 + 2.47x - 16.06 + 19$$

$$0 = -0.095x^2 + 2.47x + 2.94$$

a                      b                      c

Use quadratic formula to find the zeros.

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$= \frac{-2.47 \pm \sqrt{(2.47)^2 - 4(-0.095)(2.94)}}{2(-0.095)}$$

$$= \frac{-2.47 \pm \sqrt{6.1009 + 1.1172}}{-0.19}$$

$$= \frac{-2.47 \pm 2.69}{-0.19}$$

-1.16

27.16

The javelin travelled 27.16m.

$$\textcircled{2} \quad (h, k) = (15, 22)$$

$$(x, y) = (0, 6)$$

$$y = a(x-h)^2 + k$$

$$6 = a(0-15)^2 + 22$$

$$6 = a(-15)^2 + 22$$

$$6 = 225a + 22$$

$$-225a = 22 - 6$$

$$\frac{-225a}{-225} = \frac{16}{-225} \quad \therefore a = -0.0711$$

$$y = a(x-h)^2 + k$$

$$y = -0.0711(x-15)^2 + 22$$

$$y = -0.0711(x-15)(x-15) + 22$$

$$y = -0.0711(x^2 - 30x + 225) + 22$$

$$y = -0.0711x^2 + 2.13x - 15.975 + 22$$

$$y = -0.0711x^2 + 2.13x + 6.025$$

Let  
y=0

$$0 = \frac{-0.0711}{a}x^2 + \frac{2.13}{b}x + \frac{6.025}{c}$$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

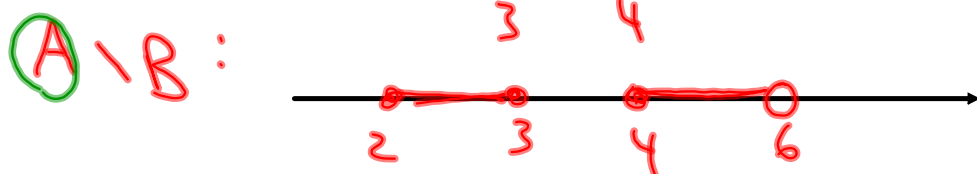
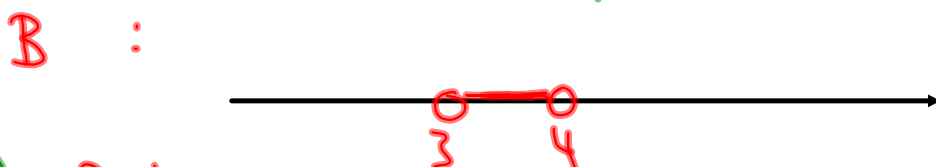
ANS  
32.60m

Back to Number Line Stuff :

$$A = \{ x \in \mathbb{R} \mid 2 \leq x < 6 \}$$

$$B = \{ x \in \mathbb{R} \mid 3 < x < 4 \}$$

Find  $A \setminus B$



set-b

$$\{ x \in \mathbb{R} \mid 2 \leq x \leq 3 \vee 4 \leq x < 6 \}$$

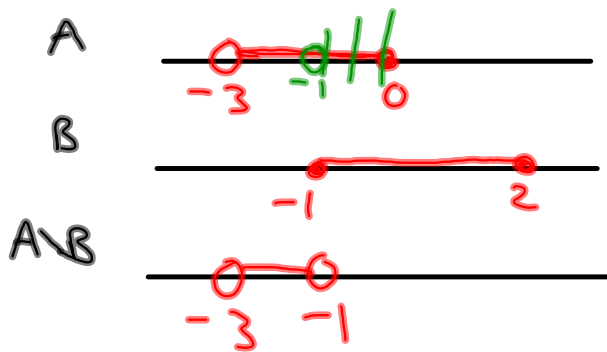
interval not:

$$[2, 3] \cup [4, 6[$$

$$A = ]-3, 0]$$

$$B = [-1, 2]$$

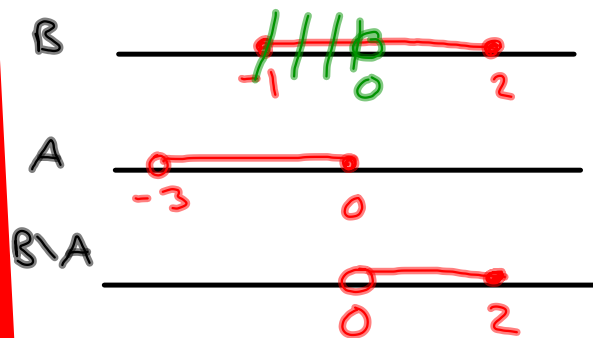
Find  $A \setminus B$



$$]-3, -1[$$

$$\{x \in \mathbb{R} \mid -3 < x < -1\}$$

Find  $B \setminus A$

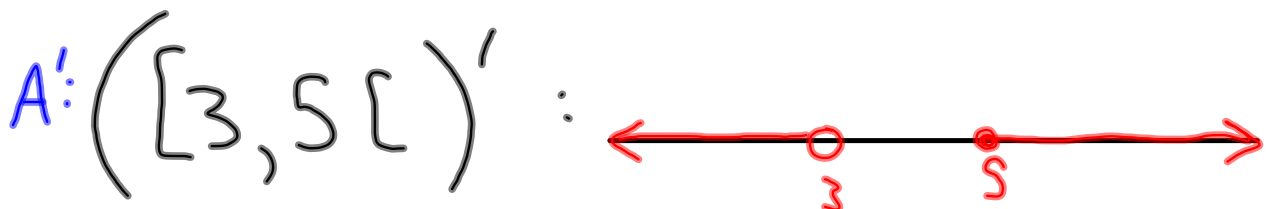
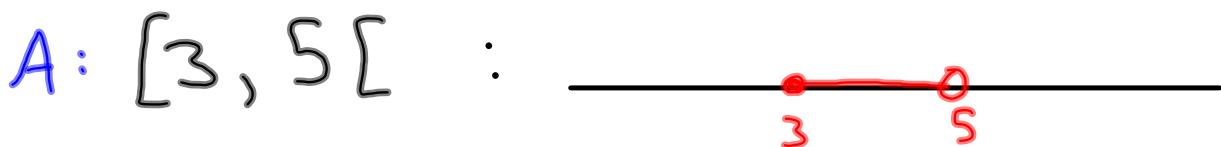
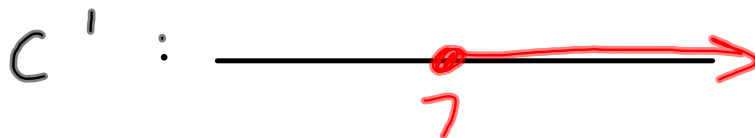


$$]0, 2]$$

$$\{x \in \mathbb{R} \mid 0 < x \leq 2\}$$

$$C = \{x \in \mathbb{R} \mid x < 7\}$$

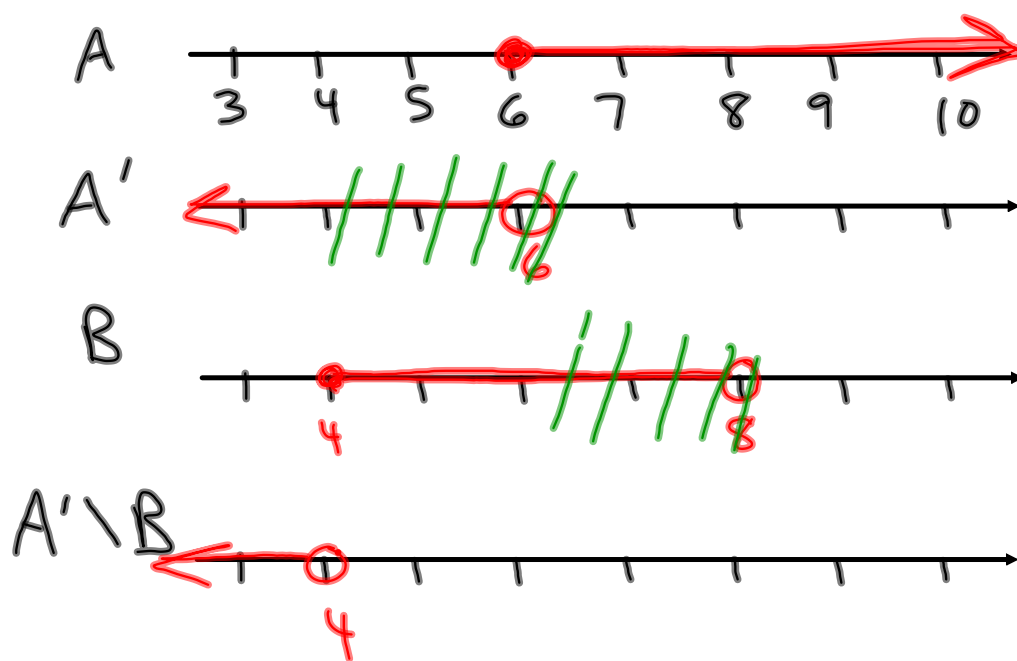
Find  $C'$



$$-\infty, 3[ \cup [5, \infty$$

$$\{x \in \mathbb{R} \mid x < 3 \vee x \geq 5\}$$

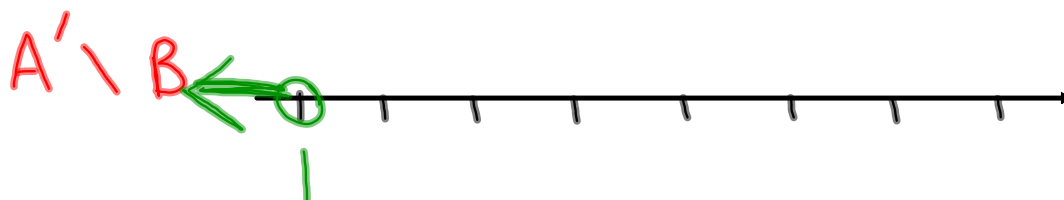
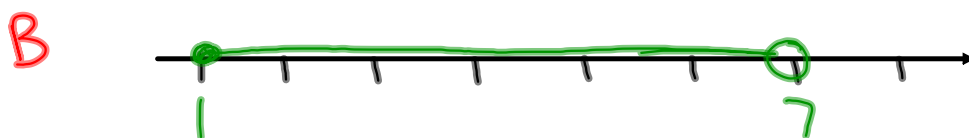
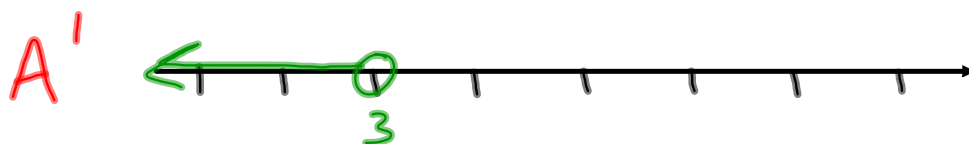
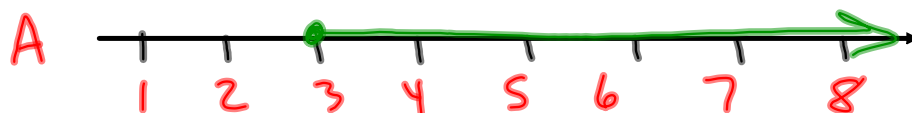
e.g.



$$-\infty, 4[$$

$$\{x \in \mathbb{R} \mid x < 4\}$$

①



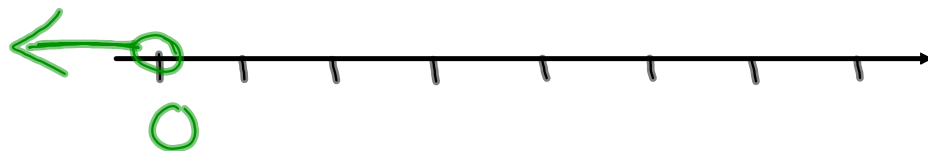
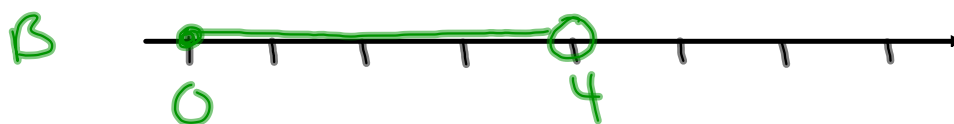
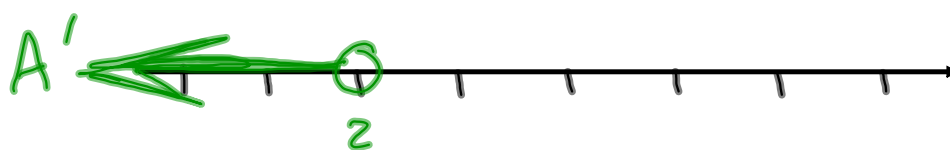
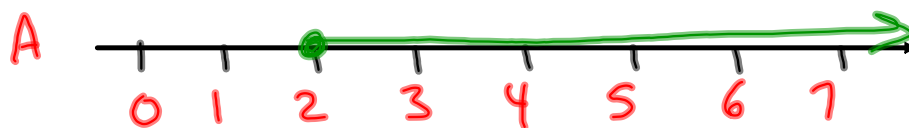
$$-\infty, 1[$$

$$\{x \in \mathbb{R} \mid x < 1\}$$



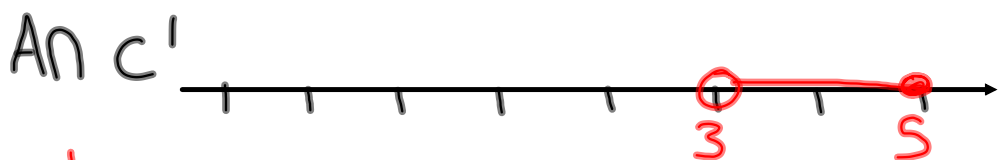
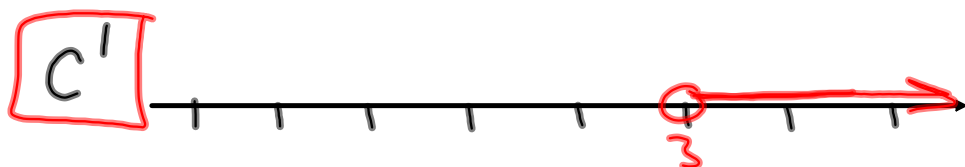
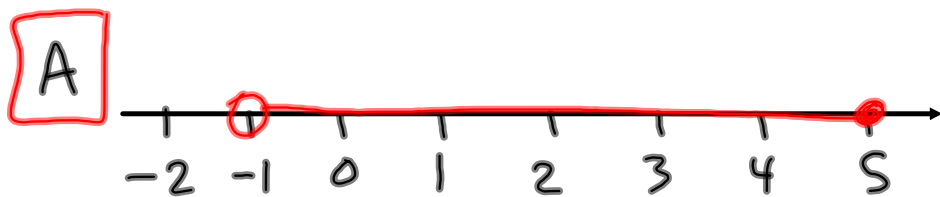
②

p.3



$$-\infty, 0[$$

$$\{x \in \mathbb{R} \mid x < 0\}$$

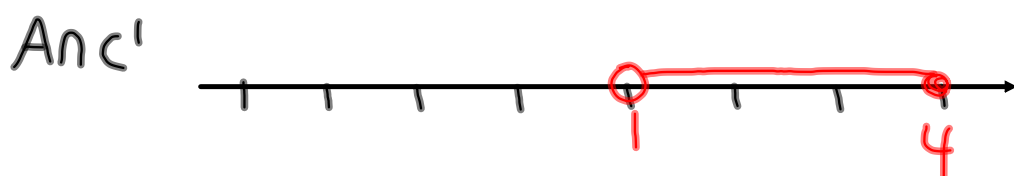
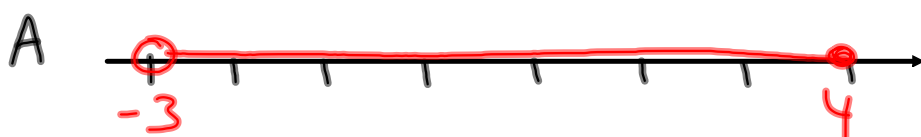
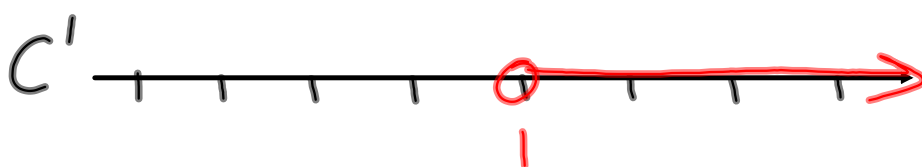


↓  
 $\neq (A \cap C)'$

$$]3, 5]$$

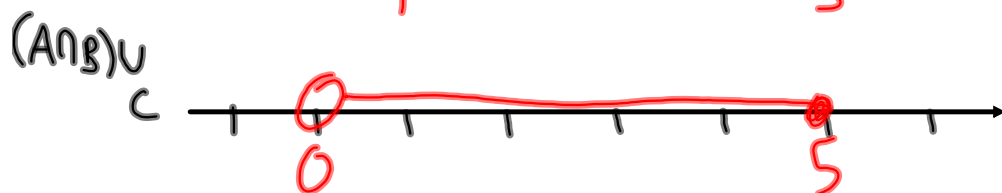
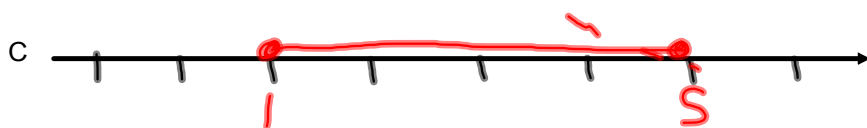
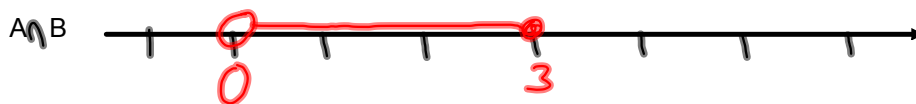
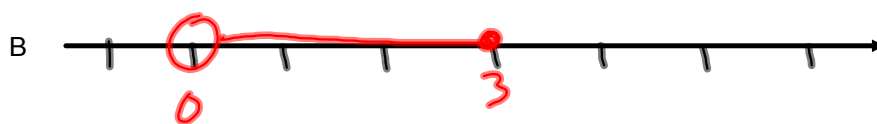
$$\{x \in \mathbb{R} \mid 3 < x \leq 5\}$$

④



$$]1, 4]$$

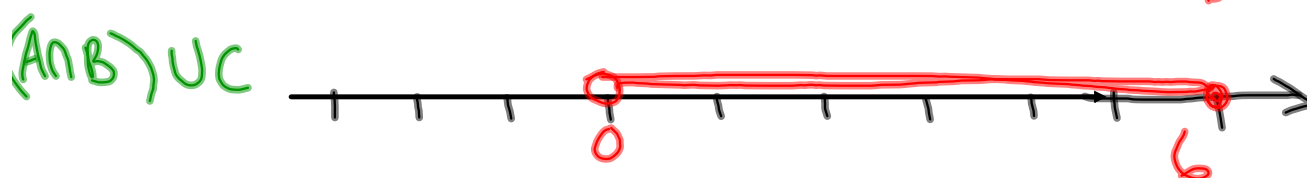
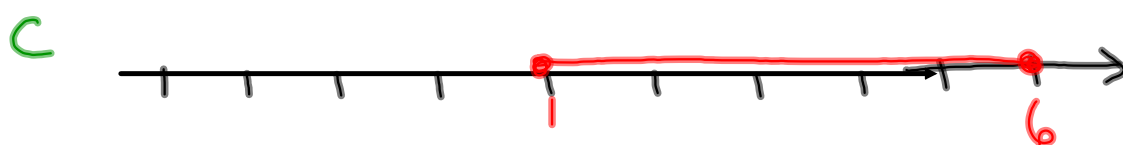
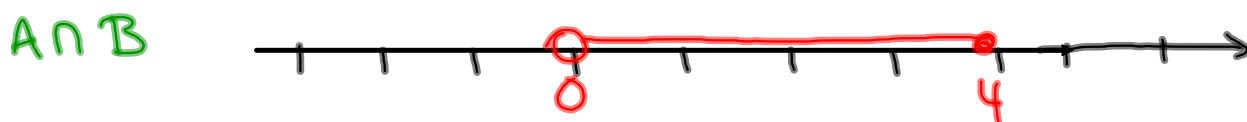
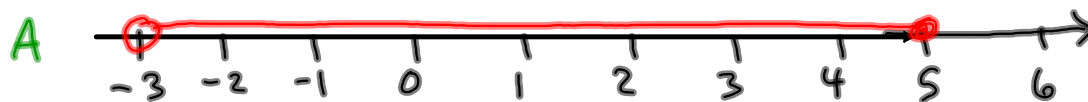
$$\{x \in \mathbb{R} \mid 1 < x \leq 4\}$$



$$]0, 5]$$

$$\{x \in \mathbb{R} \mid 0 < x \leq 5\}$$

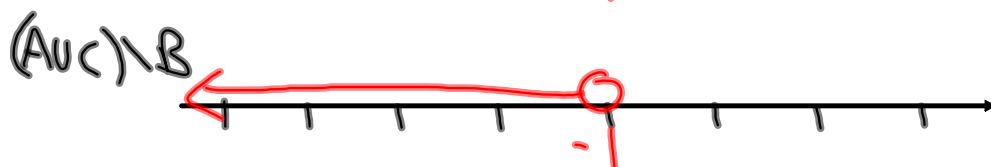
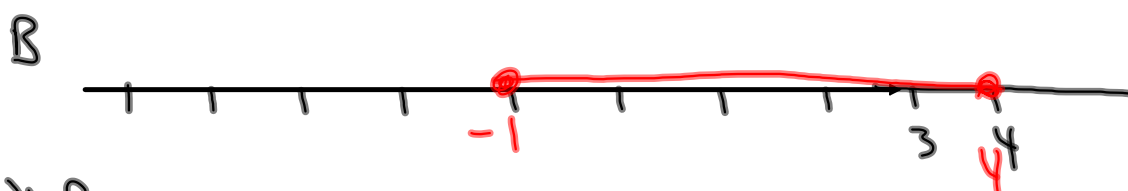
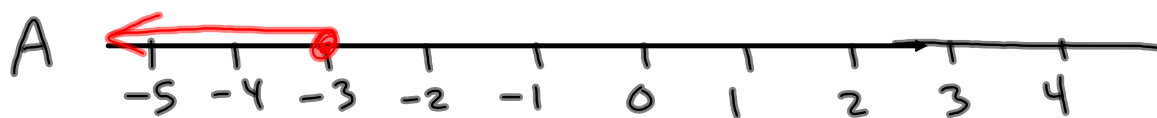
1.



$$]0,6]$$

$$\{x \in \mathbb{R} \mid 0 < x \leq 6\}$$

3.  $(A \cup C) \setminus B$



$$-\infty, -1[$$

$$\{x \in \mathbb{R} \mid x < -1\}$$