

SOURCE CODE 1. Schnittpunkte zweier Parabel mit Brennpunkten  $p_1, p_2$  und gemeinsamer Leitlinie  $y = h$ .

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def parabolic_intersections(p1, p2, h):  
    """Return the x-coordinates of the (two, in general) intersections  
    of parabolas with focus/directrix (p1,y=h) and (p2,y=h):"""  
    a,b = p1  
    c,d = p2  
    if b < h or d < h:  
        print(f'Invalid input: {p1}, {p2} are not both above line y = {h}.')  
        return None  
  
    if d == h:  
        # In this case, the parabola is degenerate: A vertical ray starting  
        # upwards in (c,d).  
        return [c]*2  
  
    if b == h:  
        # In this case, the parabola is degenerate: A vertical ray starting  
        # upwards in (a,b).  
        return [a]*2  
  
    if b == d:  
        # In this case, there is only _one_ point of intersection:  
        return [(a+c)/2]*2  
  
    # Implicit else: We expect _two_ points of intersection!  
    discriminant = ((a-c)**2 + (b-d)**2)/((b-h)*(d-h))  
    sqareroot_with_factor = (d-h)*np.sqrt(discriminant)  
    c1, c2 = c - sqareroot_with_factor, c + sqareroot_with_factor  
  
    # Return the x-coordinates of the (two) points of intersection:  
    return sorted([(a*(h-d) + (b-h)*cc)/(b-d) for cc in [c2, c1]])
```