# Transcript for

# Resolution of a Force into a Force and a Couple - Adaptive Map Worked Example 1

**0:01**

All right, in this example we are asked to resolve the force shown below-this four-pound force-into a force and a couple about point A. We need to move this force from its original location over to point A and find the statically equivalent version of the original force.

The first thing I'm going to do is redraw the setup. Point A is over here, and we have a beam. Acting on this beam is the four-pound force, and the distance from the force's point of application to point A is six feet.

**0:49**

The first conceptual step is to think about adding a four-pound force at point A. I add that force, and then I add an equal and opposite force at the same point. So now I have four pounds downward and four pounds upward. Because these two added forces are equal and opposite, I have essentially added zero to the system.

Now I can think about two things. First, I consider the couple created by the relocated force and its equal and opposite counterpart. I have a four-pound force here and an equal, opposite, and parallel force over there. They are not collinear, so they form a couple.

**1:46**

The moment exerted by this couple is equal to the magnitude of the force-four pounds-times the perpendicular distance, which in this case is six feet. This gives a moment of 24 foot-pounds. Using the right-hand rule, I determine that the moment is positive.

**2:18**

With that, I replace the pair of forces with a single couple, since they produce no net force. I redraw the system with only the moment. The moment of the couple is 24 foot-pounds, and because it is positive, it acts in the counterclockwise direction.

What I am left with is a single four-pound force and a 24 foot-pound moment, both acting about point

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A-the point about which we are resolving the system.

**3:06**

With that, I have taken the force, moved it over to point A, and found the equivalent force and moment. That completes the problem. Thank you for watching, and I hope to see you again.