How to generate a circle through three points

Let the three given points be a, b, c. Use x and y subscripts represent x and y coordinates, so that the x and y co-ordinates of a are a_x and a_y.

The coordinates of the center p = (p_x, p_y) of the circle determined by a, b, and c are:

$$A = b_x - a_x$$
$$B = b_y - a_y$$
$$C = c_x - a_x$$
$$D = c_y - a_y$$
$$E = A \times (a_x + b_x) + B \times (a_y + b_y)$$
$$F = C \times (a_x + c_x) + D \times (a_y + c_y)$$
$$G = 2 \times (A \times (c_y - b_y) - B \times (c_x - b_x))$$
$$p_x = (D \times E - B \times F) \div G$$
$$p_y = (A \times F - C \times E) \div G$$

If G is zero then the three points are collinear and no finite-radius circle through them exists. Otherwise, the radius of the circle is:

$$r^2 = (a_x - p_x)^2 + (a_y - p_y)^2$$

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