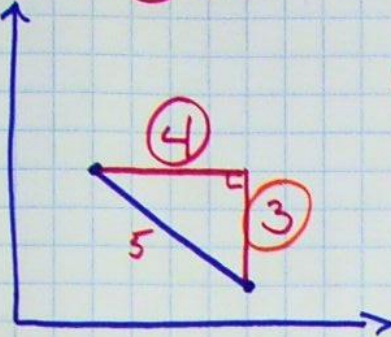


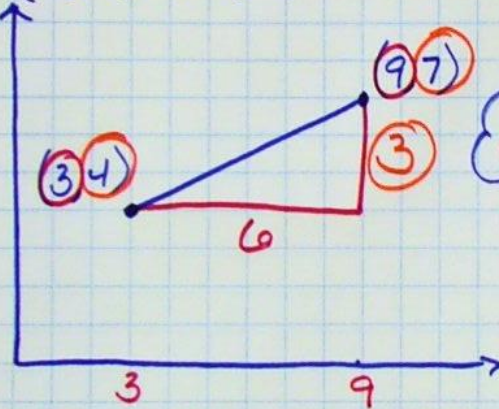
# The Distance Formula

① (6, 1) (2, 4)



$$\begin{aligned} \textcircled{1} \quad 4^2 + 3^2 &= c^2 \\ 16 + 9 &= c^2 \\ 25 &= c^2 \\ c &= 5 \text{ units} \end{aligned}$$

② (3, 4) (9, 7)



$$\begin{aligned} d^2 &= (x_2 - x_1)^2 + (y_2 - y_1)^2 \\ d &= \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2} \end{aligned}$$

optional

$$d = \sqrt{(-2 - -8)^2 + (1 - -5)^2}$$

③  $(\overset{x}{-2}, \overset{y}{1})$   $(\overset{x}{-8}, \overset{y}{-5})$

$$d = \sqrt{6^2 + 6^2}$$

$$d = \sqrt{36 + 36}$$

$$d = \sqrt{72} = \boxed{6\sqrt{2} \approx 8.5 \text{ u}}$$

④  $(\overset{x}{-4}, \overset{y}{-3})$   $(\overset{x}{-10}, \overset{y}{0})$

$$d = \sqrt{6^2 + 3^2}$$

$$d = \sqrt{36 + 9}$$

$$d = \sqrt{45} = \boxed{3\sqrt{5} \approx 6.7 \text{ u}}$$

## Practice

### Integration: Geometry The Distance Formula

Find the distance between each pair of points whose coordinates are given. Express answers in simplest radical form and as decimal approximations rounded to the nearest hundredth.

1.  $(9, 7), (1, 1)$

2.  $(5, 2), (8, -2)$

3.  $(1, -3), (1, 4)$

4.  $(7, 2), (-5, 7)$

5.  $(5, 2), (3, 10)$

6.  $(-1, -4), (-6, 0)$

7.  $(-3, -1), (-11, 3)$

8.  $(-3, -8), (-7, 2)$

9.  $(0, -4), (3, 2)$

10.  $(-6, 3), (10, 3)$

### Simplify.

9)  $\sqrt{28x^3y^3}$

10)  $\sqrt{200m^4n}$

11)  $\sqrt{75x^2y}$

12)  $\sqrt{64m^3n^3}$

19)  $-6\sqrt{150r}$

20)  $5\sqrt{80a^2}$

21)  $2\sqrt{125v}$

22)  $-8\sqrt{24k^3}$

23)  $-4\sqrt{192x}$

24)  $2\sqrt{8p^2q^3r}$

25)  $-4\sqrt{216x^2y^2z}$

26)  $-3\sqrt{24a^4b^2c^3}$

27)  $3\sqrt{16x^4y^4z}$

28)  $-2\sqrt{48a^3b^4c^2}$

29)  $6\sqrt{75mp^2q^3}$

30)  $4\sqrt{36x^2y^3z^4}$