

Topic: Quadrant of the angle

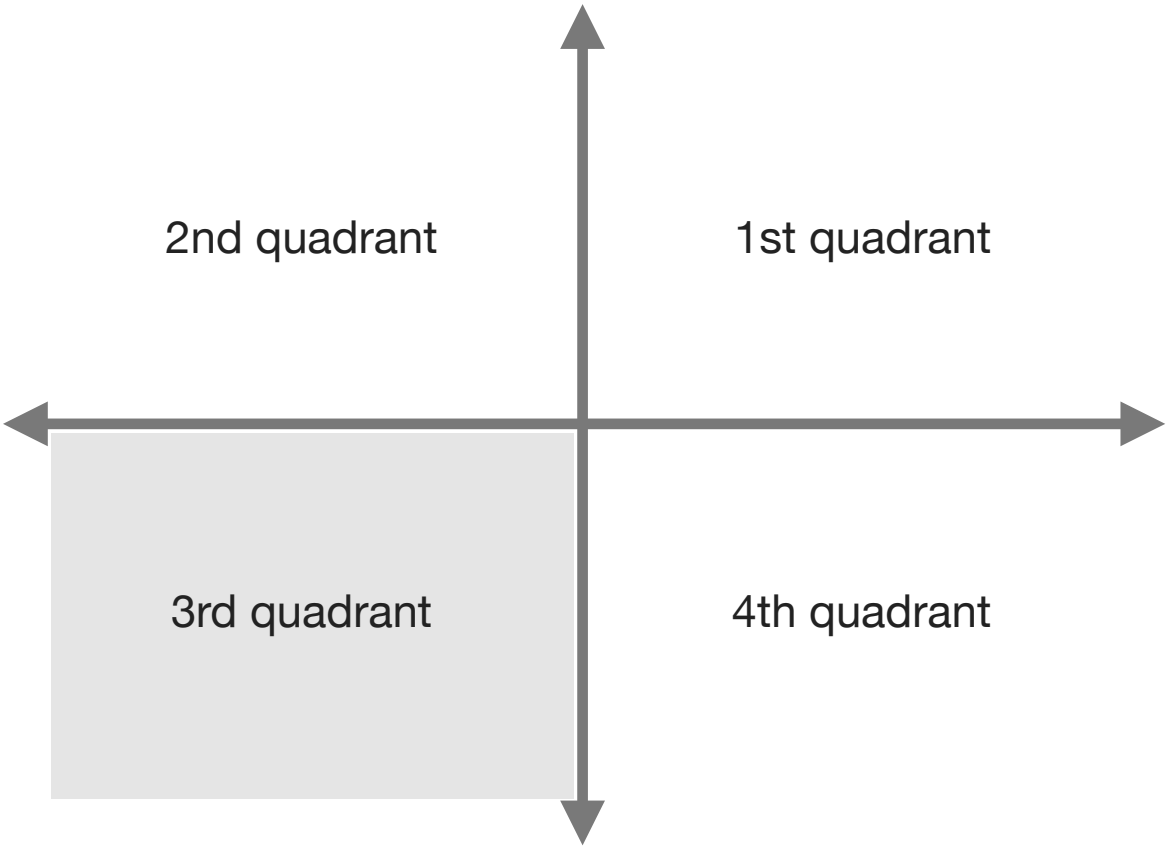
Question: Which two axes make up the boundary of the third quadrant?

Answer choices:

- A The positive horizontal axis and the negative vertical axis
- B The negative horizontal axis and the negative vertical axis
- C The positive horizontal axis and the positive vertical axis
- D The negative horizontal axis and the positive vertical axis

Solution: B

As shown in the shaded region of the figure, the third quadrant is bounded by the negative horizontal axis and the negative vertical axis.



Topic: Quadrant of the angle

Question: In which quadrant is the angle located?

$$-1,600^\circ$$

Answer choices:

- A First quadrant
- B Second quadrant
- C Third quadrant
- D Fourth quadrant

Solution: C

To answer this question, we can use our tried-and-true method of finding an angle in the range 0° to 360° that differs from an angle of $-1,600^\circ$ by some integer multiple of 360° .

Since the given angle is negative, we need to add positive integer multiples of 360° to $-1,600^\circ$ to find such an angle.

$$-1,600^\circ + 360^\circ = -1,240^\circ$$

$$-1,600^\circ + 2(360^\circ) = -1,240^\circ + 360^\circ = -880^\circ$$

$$-1,600^\circ + 3(360^\circ) = -880^\circ + 360^\circ = -520^\circ$$

$$-1,600^\circ + 4(360^\circ) = -520^\circ + 360^\circ = -160^\circ$$

$$-1,600^\circ + 5(360^\circ) = -160^\circ + 360^\circ = 200^\circ$$

Note that 200° is in the range 0° to 360° ; in particular,

$$180^\circ < 200^\circ < 270^\circ$$

An angle of 180° is on the negative horizontal axis, and an angle of 270° is on the negative vertical axis. Thus an angle of 200° is in the third quadrant. Since $-1,600^\circ$ differs from 200° by an integer multiple of 360° , an angle of $-1,600^\circ$ is also in the third quadrant.