

Polar Coordinates - Homework #1 Answers

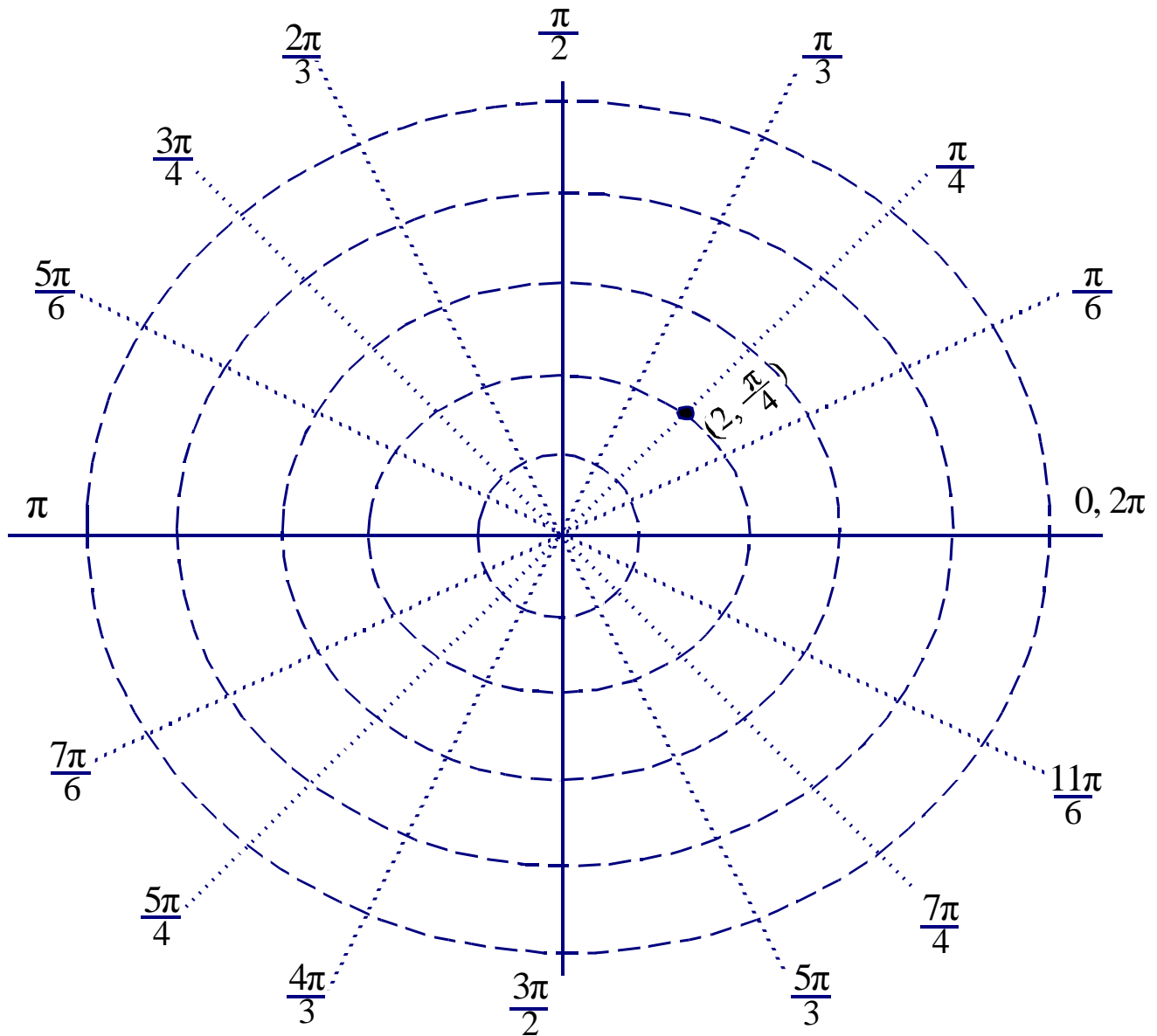
SPRING 2018

Pat Rossi

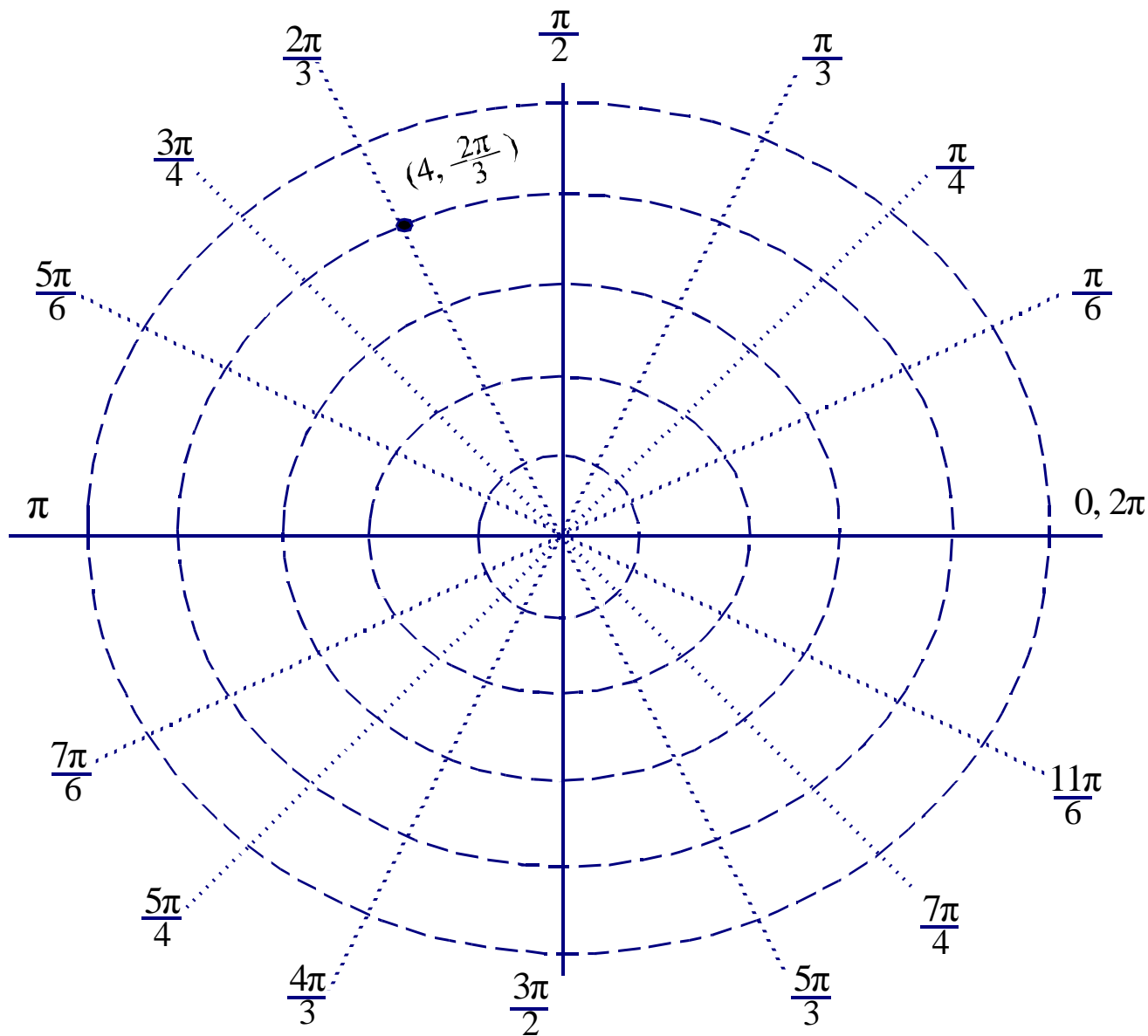
Name _____

In Exercises 1-8, the points are expressed using polar coordinates. Graph the points. Feel free to use the polar grid template from my website (pat-rossi.com >> Academic Links >> MTH 2227 >> Handouts >> Polar Grid) to graph the points.

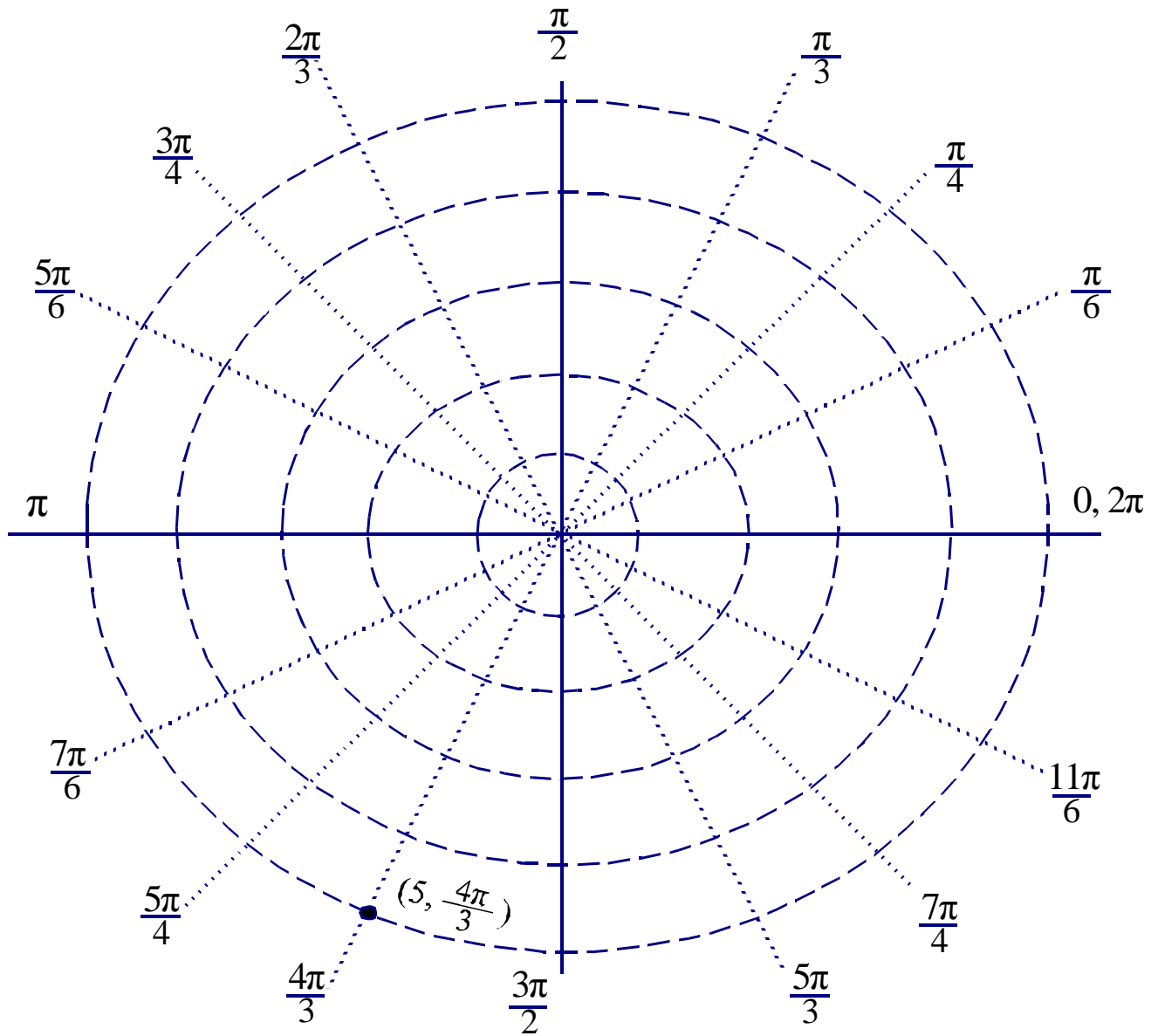
1. $(r, \theta) = (2, \frac{\pi}{4})$



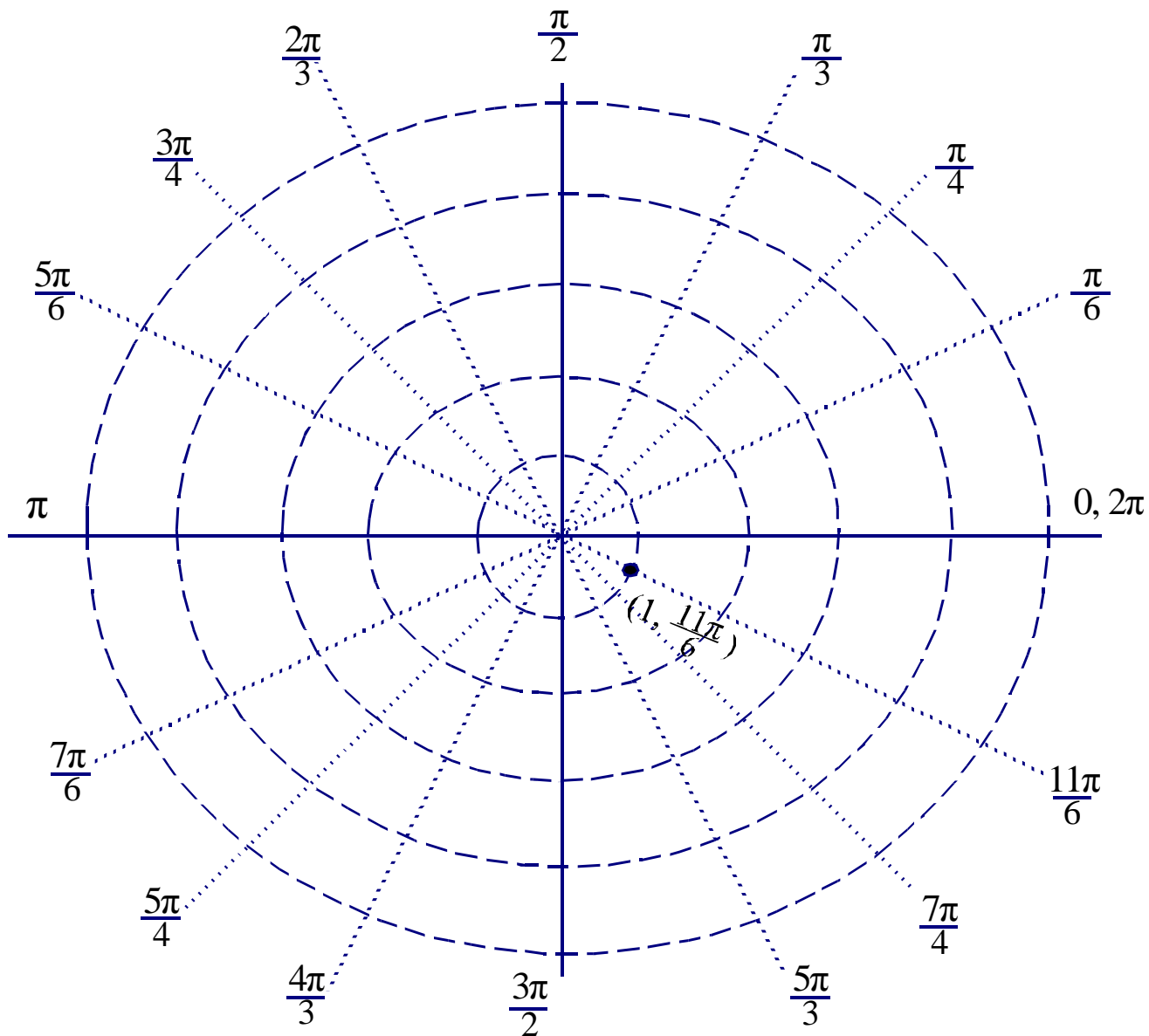
2. $(r, \theta) = (4, \frac{2\pi}{3})$



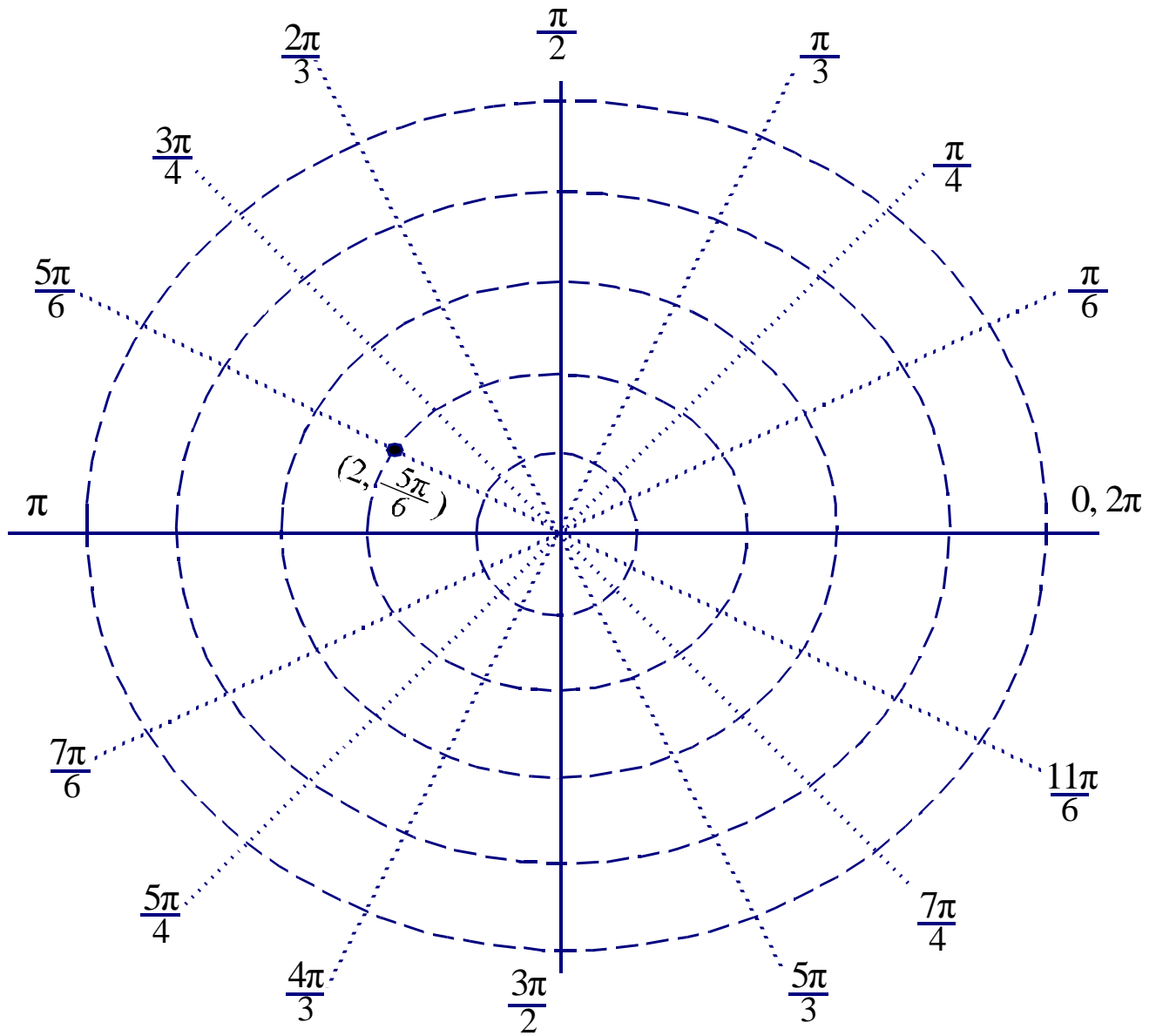
3. $(r, \theta) = (5, \frac{4\pi}{3})$



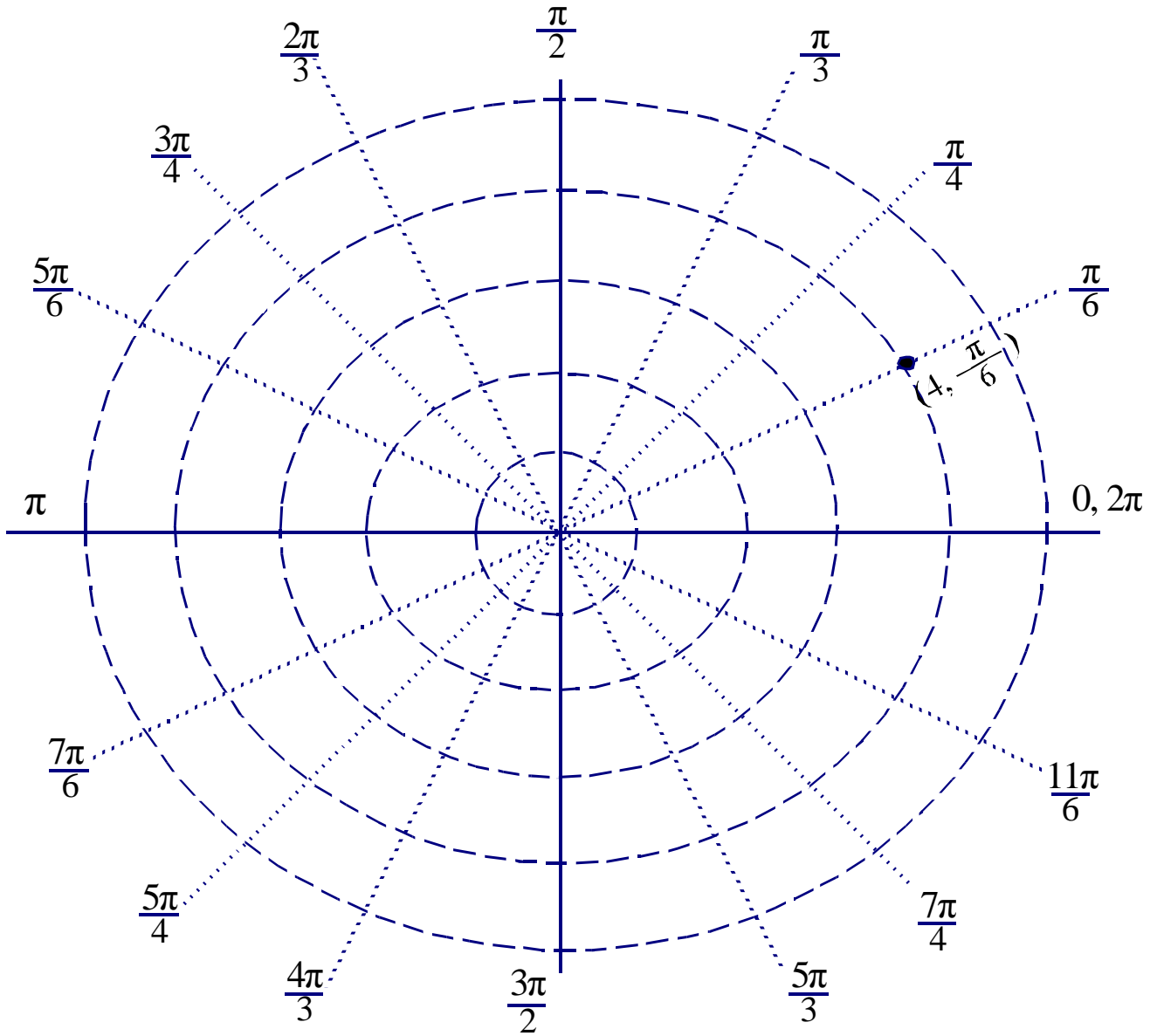
4. $(r, \theta) = (1, \frac{11\pi}{6})$



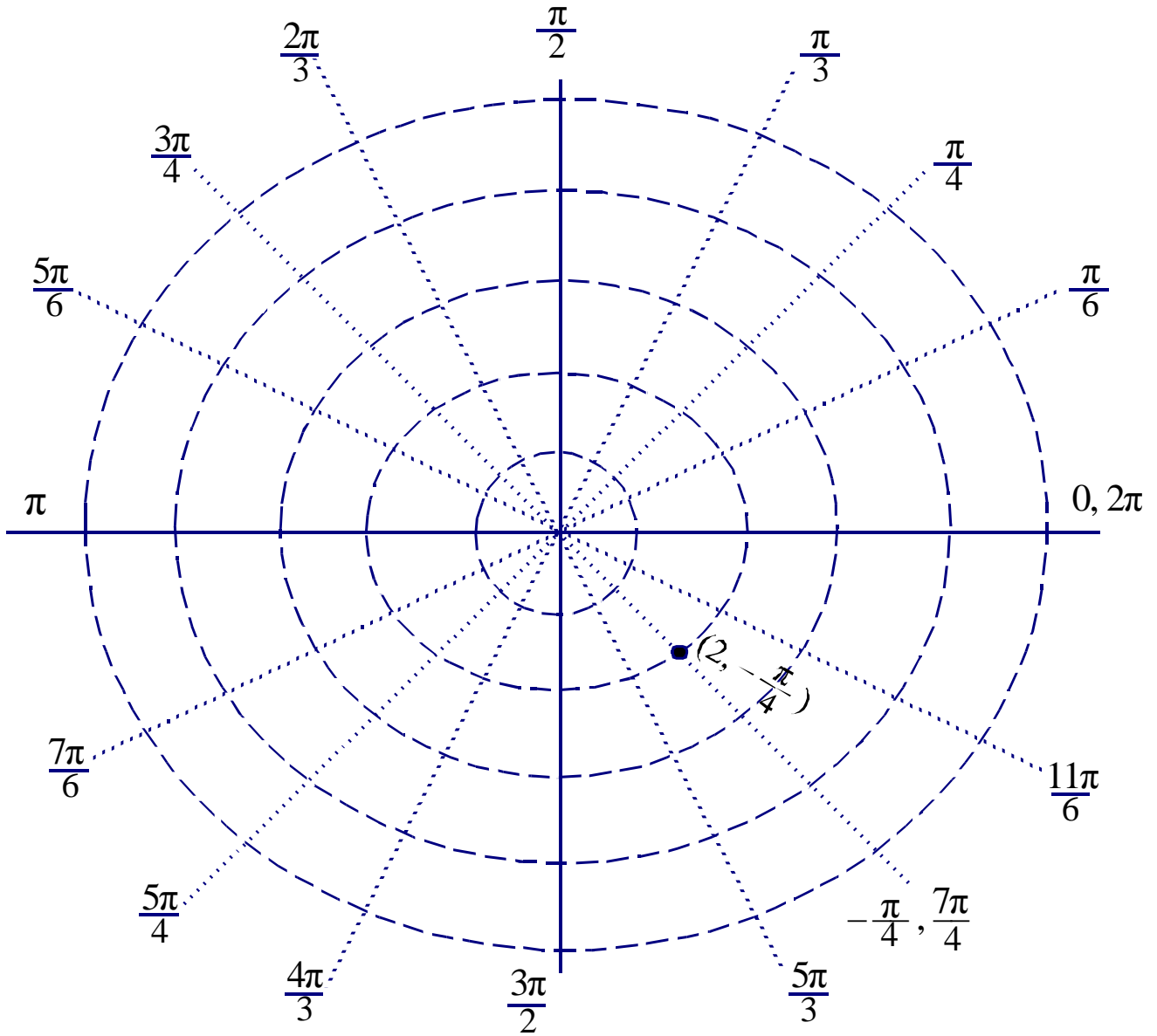
5. $(r, \theta) = (2, \frac{5\pi}{6})$



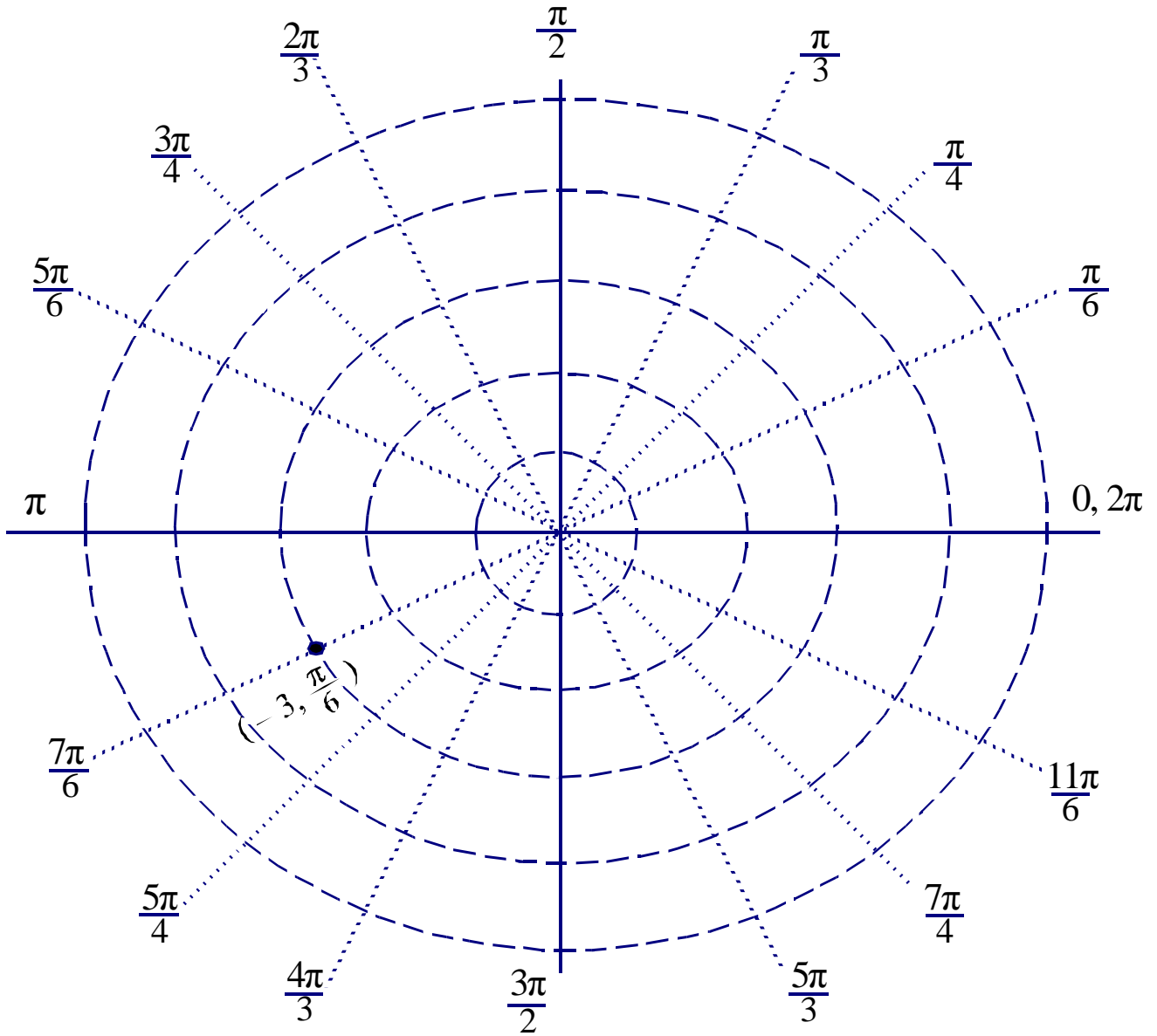
6. $(r, \theta) = (4, \frac{\pi}{6})$



7. $(r, \theta) = (2, -\frac{\pi}{4})$



8. $(r, \theta) = (-3, \frac{\pi}{6})$



In Exercises 9-16, the given point is expressed in rectangular coordinates. Express the same point in polar coordinates.

9. $(x, y) = (4, 4)$

$$(r, \theta) = (4\sqrt{2}, \frac{\pi}{4})$$

10. $(x, y) = \left(-\frac{5}{2}, \frac{5\sqrt{3}}{2}\right)$

$$(r, \theta) = \left(5, \frac{2}{3}\pi\right)$$

11. $(x, y) = (3, 0)$

$$(r, \theta) = (3, 0)$$

12. $(x, y) = (0, -4)$

$$(r, \theta) = \left(4, -\frac{\pi}{2}\right) \quad (r, \theta) = \left(4, \frac{3\pi}{2}\right) \text{ is also acceptable}$$

13. $(x, y) = (-\sqrt{3}, 1)$

$$(r, \theta) = \left(2, \frac{5\pi}{6}\right)$$

14. $(x, y) = (-2, -2)$

$$(r, \theta) = \left(2\sqrt{2}, \frac{5\pi}{4}\right)$$

15. $(x, y) = \left(-6, -\frac{6}{\sqrt{3}}\right)$

$$(r, \theta) = \left(4\sqrt{3}, \frac{7\pi}{6}\right)$$

16. $(x, y) = \left(2, \frac{-2\sqrt{3}}{3}\right)$

$$(r, \theta) = \left(\frac{4\sqrt{3}}{3}, -\frac{\pi}{3}\right) \quad (r, \theta) = \left(\frac{4\sqrt{3}}{3}, \frac{5\pi}{3}\right) \text{ is also acceptable}$$

In Exercises 17-24, the given point is expressed in polar coordinates. Express the same point in rectangular coordinates.

17. $(r, \theta) = (2, \frac{\pi}{4})$

$$(x, y) = (\sqrt{2}, \sqrt{2})$$

18. $(r, \theta) = (4, \frac{2\pi}{3})$

$$(x, y) = (-2, 2\sqrt{3})$$

19. $(r, \theta) = (5, \frac{4\pi}{3})$

$$(x, y) = \left(-\frac{5}{2}, -\frac{5\sqrt{3}}{2}\right)$$

20. $(r, \theta) = (1, \frac{11\pi}{6})$

$$(x, y) = \left(\frac{\sqrt{3}}{2}, -\frac{1}{2}\right)$$

21. $(r, \theta) = (2, \frac{5\pi}{6})$

$$(x, y) = (-\sqrt{3}, 1)$$

22. $(r, \theta) = (4, \frac{\pi}{6})$

$$(x, y) = (2\sqrt{3}, 2)$$

23. $(r, \theta) = (2, -\frac{\pi}{4})$

$$(x, y) = (\sqrt{2}, -\sqrt{2})$$

24. $(r, \theta) = (-3, \frac{\pi}{6})$

$$(x, y) = \left(-\frac{3\sqrt{3}}{2}, -\frac{3}{2}\right)$$