Task card 1 Related Rates with Derivatives

The radius of a circle grows at 5 cm/s. How fast is the area growing when the radius is 4 cm?

Task card 2 Related Rates with Derivatives

A spherical balloon is inflated so its radius grows at 3 in/s. How fast is the volume growing when the radius is 2 in?

Task card 3 Related Rates with Derivatives

Water is poured into a cylindrical tank of radius 5 in at 75π in^3/s. How fast is the water level rising?

Task card 4 Related Rates with Derivatives

The area of a square grows at 24 cm^2/s. How fast is each side growing when the side is 12 cm?

Task card 5 Related Rates with Derivatives

Each edge of a cube grows at 2 ft/min. How fast is the surface area growing when each edge is 4 ft?

Task card 6 Related Rates with Derivatives

The area of a circle grows at 16π ft^2/min. How fast is the radius growing when the radius is 2 ft?

Task card 7 — Related Rates with Derivatives

The area of a circle grows at 18π in^2/s. How fast is the radius growing when the radius is 8 in?

Task card 8 — Related Rates with Derivatives

A stone dropped in a pond makes a circular ripple whose radius grows at 6 m/min. How fast is the area growing when the radius is 16 m?

Task card 9 — Related Rates with Derivatives

A 15 ft ladder leans against a wall. Its bottom slides away from the wall at 3 ft/s. Find dy/dt, the rate the height y of the top is changing, when the bottom is 12 ft from the wall.

Task card 10 — Related Rates with Derivatives

The area of a circle grows at 22π in^2/s. How fast is the radius growing when the radius is 2 in?

Task card 11 — Related Rates with Derivatives

Water is poured into a cylindrical tank of radius 6 m at 180π m^3/min. How fast is the water level rising?

Task card 12 — Related Rates with Derivatives

Air is pumped into a spherical balloon at 44π m^3/min. How fast is the radius growing when the radius is 4 m?

Task card 13 Related Rates with Derivatives

A 17 ft ladder leans against a wall. Its top slides down the wall at 4 ft/s. How fast is the bottom moving away from the wall when the top is 8 ft above the ground?

Task card 14 Related Rates with Derivatives

Each edge of a cube grows at 3 in/s. How fast is the volume growing when each edge is 8 in?

Task card 15 Related Rates with Derivatives

Water is poured into a cylindrical tank of radius 3 m at 18π m^3/min. How fast is the water level rising?

Task card 16 Related Rates with Derivatives

Air is pumped into a spherical balloon at 40π m^3/min. How fast is the radius growing when the radius is 2 m?

Task card 17 Related Rates with Derivatives

A 13 ft ladder leans against a wall. Its bottom slides away from the wall at 4 ft/s. Find dy/dt, the rate the height y of the top is changing, when the bottom is 5 ft from the wall.

Task card 18 Related Rates with Derivatives

The area of a circle grows at 16π ft^2/min. How fast is the radius growing when the radius is 4 ft?

Task card 19 Related Rates with Derivatives

Water is poured into a cylindrical tank of radius 6 cm at 180π cm^3/s. How fast is the water level rising?

Task card 20 Related Rates with Derivatives

Air is pumped into a spherical balloon at 48π m^3/min. How fast is the radius growing when the radius is 3 m?

Task card 21 Related Rates with Derivatives

A 17 ft ladder leans against a wall. Its top slides down the wall at 1 ft/s. How fast is the bottom moving away from the wall when the top is 15 ft above the ground?

Task card 22 Related Rates with Derivatives

Each edge of a cube grows at 2 in/s. How fast is the volume growing when each edge is 7 in?

Task card 23 Related Rates with Derivatives

A 13 ft ladder leans against a wall. Its bottom slides away from the wall at 3 ft/s. Find dy/dt, the rate the height y of the top is changing, when the bottom is 12 ft from the wall.

Task card 24 Related Rates with Derivatives

A 15 ft ladder leans against a wall. Its top slides down the wall at 1 ft/s. How fast is the bottom moving away from the wall when the top is 9 ft above the ground?

Related Rates with Derivatives Task Cards

Recording sheet · Grade 12 · Give exact answers with no units: a whole number, a fraction in simplest form, or a multiple of π written like 24π. A negative rate means the quantity is getting smaller.

Scan to check your answers

Name: _____ Date: _____

1	2	3	4
5	6	7	8
9	10	11	12
13	14	15	16
17	18	19	20
21	22	23	24

Related Rates with Derivatives Task Cards: Answer Key

Grade 12 · Medium

The answers online

1. 40π	**2.** 48π	**3.** 3
4. 1	**5.** 96	**6.** 4
7. $\frac{9}{8}$	**8.** 192π	**9.** -4
10. $\frac{11}{2}$	**11.** 5	**12.** $\frac{11}{16}$
13. $\frac{32}{15}$	**14.** 576	**15.** 2
16. $\frac{5}{2}$	**17.** $-\frac{5}{3}$	**18.** 2
19. 5	**20.** $\frac{4}{3}$	**21.** $\frac{15}{8}$
22. 294	**23.** $-\frac{36}{5}$	**24.** $\frac{3}{4}$