

Cosmic Calculations: Pre-Algebra in Space

Pre-Algebra · Answer Key · 25 Questions

1. The planet Mercury orbits the Sun once every 88 Earth days. How many full orbits does Mercury complete in 352 Earth days?

- A) 2
- B) 4**
- C) 6
- D) 8

2. The speed of light is approximately 300,000 kilometers per second. If a signal takes 500 seconds to travel from the Sun to Earth, what is the approximate distance in kilometers?

- A) 15,000,000
- B) 150,000,000**
- C) 300,000,000
- D) 1,500,000,000

3. Venus rotates on its axis once every 243 Earth days. If a probe stays on Venus for 486 Earth days, how many full rotations will Venus complete?

- A) 1
- B) 2**
- C) 3
- D) 4

4. Jupiter has 95 officially recognized moons. If Saturn has 146, what is the difference in the number of moons between Saturn and Jupiter?

- A) 49
- B) 51**
- C) 55
- D) 61

5. Earth's circumference is about 40,075 kilometers. If a satellite orbits at a speed of 8 kilometers per second, how many seconds does it take to travel 40,000 kilometers?

- A) 5,000**
- B) 5,500
- C) 6,000
- D) 8,000

6. Mars has two moons, Phobos and Deimos. If a telescope observes 15 Martian systems, each with 2 moons, what is the total number of moons observed?

- A) 17
- B) 25
- C) 30**
- D) 45

7. The asteroid belt is located between Mars and Jupiter. If an asteroid travels at 20 kilometers per second for 60 seconds, what total distance has it covered?

- A) 800 km
- B) 1,200 km**
- C) 1,800 km
- D) 2,400 km

8. Neptune is approximately 4.5 billion kilometers from the Sun. If a spacecraft travels 0.5 billion kilometers per year, how many years does it take to reach Neptune?

- A) 7
- B) 9**
- C) 10
- D) 12

9. A light-year is approximately 9.46 trillion kilometers. If a star is 2 light-years away, what is the distance in trillions of kilometers?

- A) 18.92**
- B) 19.46
- C) 28.38
- D) 9.48

10. The gravity on the Moon is about 1/6th of Earth's gravity. If an object weighs 60 kilograms on Earth, how many kilograms does it weigh on the Moon?

- A) 6
- B) 10**
- C) 12
- D) 20

11. Uranus takes 84 Earth years to orbit the Sun. How many Earth years does it take for Uranus to complete 0.5 of its orbit?

- A) 21
- B) 42**
- C) 44
- D) 84

12. A day on Saturn is about 10.7 hours long. How many hours are in 2 full Saturnian days?

A) 20.4

B) 21.4

C) 22.4

D) 25.4

13. The diameter of the Sun is approximately 1.4 million kilometers. If the diameter of the Earth is 12,742 kilometers, how many times larger is the Sun's diameter than Earth's (approximately)?

A) 50

B) 100

C) 110

D) 150

14. If a comet appears every 75 years, and it last appeared in 1986, in what year will it next appear?

A) 2051

B) 2061

C) 2071

D) 2086

15. Pluto takes 248 Earth years to orbit the Sun. How many full orbits does Pluto complete in 496 Earth years?

A) 1

B) 2

C) 3

D) 4

16. A rocket requires 10,000 kilograms of fuel to travel 1,000 kilometers. How many kilograms of fuel are required for 5,000 kilometers?

A) 20,000

B) 40,000

C) 50,000

D) 60,000

17. The orbital speed of Earth is approximately 30 kilometers per second. How far does Earth travel in 10 seconds?

A) 3 km

B) 30 km

C) 300 km

D) 3,000 km

18. If a planet has an average temperature of -200 degrees Celsius and another has -50 degrees Celsius, what is the numerical difference between the two temperatures?

A) 150

B) 250

C) 300

D) 350

19. If 1 astronomical unit (AU) is 150 million kilometers, how many kilometers is 3 AU?

A) 300 million

B) 450 million

C) 600 million

D) 750 million

20. A cluster contains 500 galaxies. If 20 percent of them are spiral galaxies, how many spiral galaxies are in the cluster?

A) 50

B) 80

C) 100

D) 120

21. The Great Red Spot on Jupiter is about 16,000 kilometers wide. If Earth's diameter is 12,742 kilometers, approximately how many Earths could fit across the width of the spot?

A) 1.25

B) 2.5

C) 3.75

D) 5

22. If light travels 300,000 km in 1 second, how far does it travel in 1 minute (60 seconds)?

A) 1.8 million km

B) 18 million km

C) 180 million km

D) 1.8 billion km

23. If an astronaut's suit costs \$12 million and a space helmet costs \$2 million, what is the ratio of the cost of the suit to the helmet?

A) 2:1

B) 4:1

C) 6:1

D) 8:1

24. Mars has a mean distance from the Sun of 1.5 AU. If Earth is 1 AU from the Sun, how many AU further from the Sun is Mars?

A) 0.5

B) 1.0

C) 2.5

D) 3.0

25. The moon Titan takes 16 days to orbit Saturn. How many orbits does it complete in 64 days?

A) 2

B) 3

C) 4

D) 5