ALGEBRA 2 & GEOMETRY

Word Problem Practice · 20 Questions

Self-Study Worksheet · Multiple Choice

Name: _____ **Date:** _____ **Score:** / 20

PART 1 — ALGEBRA 2

Q01 · QUADRATIC EQUATIONS

■ *VERTEX TIME: t = -b / (2a)*

1. A ball is thrown upward. Its height (ft) is h(t) = -16t^2 + 64t + 6. At what time does the ball reach maximum height?

A) t = 1 s

B) t = 2 s

C) t = 3 s

D) t = 4 s

Q02 · SYSTEMS OF EQUATIONS

■ *SUBSTITUTION: Isolate one variable, substitute, solve, back-substitute*

2. A theater charges $12 for adults and $7 for children. 80 tickets were sold for $755. How many adult tickets were sold?

A) 15

B) 25

C) 35

D) 55

Q03 · EXPONENTIAL GROWTH

■ *GROWTH: A = P(1 + r)^t*

3. A town's population was 4,000 in 2010 and grows at 5% per year. What will the population be in 2015?

A) 4,800

B) 5,000

C) 5,105

D) 5,526

Q04 · LOGARITHMS

■ *RICHTER: Each +1 = 10x more intensity. Ratio = 10^(difference)*

4. An earthquake measures 6.0, another measures 8.0 on the Richter scale. How many times MORE INTENSE is the second?

A) 2x

B) 20x

C) 100x

D) 1000x

Q05 · RATIONAL EXPRESSIONS

■ *WORK RATE: Add RATES (1/a + 1/b), not times*

5. Pipe A fills a tank in 6 hours; Pipe B fills it in 4 hours. How long does it take both pipes together?

A) 2.0 hrs

B) 2.4 hrs

C) 3.0 hrs

D) 5.0 hrs

Q06 · POLYNOMIAL FUNCTIONS

■ *AREA = length x width → set equal to given area, solve quadratic*

6. A garden has length (x+3) ft and width (x-1) ft. If the area is 45 sq ft, find x.

A) x = 5

B) x = 6

C) x = 7

D) x = 8

Q07 · COMPLEX NUMBERS

■ *VIETA'S: r1+r2 = -b/a, r1*r2 = c/a | r1^2+r2^2 = (r1+r2)^2 - 2r1r2*

7. The equation x^2 + 4x + 13 = 0 has complex roots. What is the sum of the SQUARES of the two solutions?

A) -10

B) -6

C) 3

D) 10

Q08 · SEQUENCES & SERIES

■ *INFINITE GEO SUM: S = a / (1-r) only if |r| < 1*

8. A ball dropped from 18 ft bounces to 2/3 of its previous height each time. What is the TOTAL vertical distance traveled?

A) 54 ft

B) 72 ft

C) 90 ft

D) 108 ft

Q09 · RADICAL EQUATIONS

■ *v = sqrt(24d) → ALWAYS check: plug answer back in*

9. A car's speed (mph) is estimated by v = sqrt(24d), where d = skid length (ft). If skid = 96 ft, how fast was the car going?

A) 36 mph

B) 40 mph

C) 48 mph

D) 52 mph

Q10 · INVERSE FUNCTIONS

■ *INVERSE: Swap x and y, solve for y. C^-1(x) = (x - b) / a*

10. Cost function: C(x) = 3x + 150. Using the inverse, how many units were produced if total cost was $630?

A) 140

B) 160

C) 175

D) 210

PART 2 — GEOMETRY

Q11 · SIMILAR TRIANGLES

■ *PROPORTION: height1 / shadow1 = height2 / shadow2*

11. A 6-foot person casts a 4-foot shadow. At the same time, a tree casts a 30-foot shadow. How tall is the tree?

A) 40 ft

B) 45 ft

C) 48 ft

D) 50 ft

Q12 · PYTHAGOREAN THEOREM

■ *a^2 + b^2 = c^2 (c = hypotenuse). Triple: 5-12-13*

12. A 13-foot ladder leans against a wall with its base 5 feet from the wall. How high does the ladder reach?

A) 8 ft

B) 10 ft

C) 11 ft

D) 12 ft

Q13 · CIRCLE THEOREMS

■ *CIRCUMFERENCE: C = pi * d (use DIAMETER, not radius directly)*

13. A circular park has a diameter of 200 meters. A jogger runs one complete lap. What distance did the jogger run? (Use pi ~ 3.14159)

A) 314 m

B) 400 m

C) 628 m

D) 1256 m

Q14 · VOLUME — COMPOSITE SOLIDS

■ *COMPOSITE: V(total) = V(cone) + V(hemisphere). Don't mix up sphere vs hemisphere!*

14. A cone (r = 3 cm, h = 12 cm) is topped with a hemisphere (r = 3 cm). Find total volume. (pi ~ 3.14)

A) 113.0 cm^3

B) 169.6 cm^3

C) 226.1 cm^3

D) 339.1 cm^3

Q15 · COORDINATE GEOMETRY

■ *DISTANCE: d = sqrt[(x2-x1)^2 + (y2-y1)^2]. Look for Pythagorean triples!*

15. Point A is at (2, 5) and point B is at (8, 13). What is the distance AB?

A) 8

B) 9

C) 10

D) 12

Q16 · SURFACE AREA

■ *CYLINDER SA: 2*pi*r^2 + 2*pi*r*h (two circles + one rectangle)*

16. A cylindrical tank (r = 5 m, h = 10 m) needs painting inside and out including top and bottom. Total surface area? (pi ~ 3.14)

A) 157.0 m^2

B) 314.0 m^2

C) 471.0 m^2

D) 628.0 m^2

Q17 · ANGLE RELATIONSHIPS

■ *CO-INTERIOR (same-side interior) angles: SUPPLEMENTARY = add to 180 degrees*

17. Two parallel streets are cut by a diagonal road. One angle is 65 degrees. What is the co-interior (same-side interior) angle?

A) 65 deg

B) 90 deg

C) 115 deg

D) 130 deg

Q18 · TRIGONOMETRY

■ *SOH-CAH-TOA: tan = Opp/Adj. Angle of depression = angle of elevation*

18. From a 50-meter cliff, you look down at a boat at an angle of depression of 30 degrees. How far is the boat from the base?

A) 25 m

B) 43.3 m

C) 57.7 m

D) 86.6 m

Q19 · PROOFS — CONGRUENCE

■ *CONGRUENCE: SSS, SAS, ASA, AAS = valid | SSA, AAA = NOT valid*

19. Two triangles share a common side. Each also has two other sides equal (3 cm and 5 cm each). Which theorem applies?

A) SAS

B) ASA

C) SSS

D) AAS

Q20 · AREA — SECTOR

■ *SECTOR AREA = (angle/360) x pi*r^2. Sector is a FRACTION of the circle.*

20. A pizza has diameter 14 in (radius 7 in). A slice has a 45 degree central angle. What is the area of the slice? (pi ~ 3.14)

A) 8.6 in^2

B) 10.0 in^2

C) 19.2 in^2

D) 38.5 in^2

ANSWER KEY

Q01 → B	**Q02 → C**	**Q03 → C**	**Q04 → C**
Q05 → B	**Q06 → B**	**Q07 → A**	**Q08 → C**
Q09 → C	**Q10 → B**	**Q11 → B**	**Q12 → D**
Q13 → C	**Q14 → B**	**Q15 → C**	**Q16 → C**
Q17 → C	**Q18 → D**	**Q19 → C**	**Q20 → C**