Algebra 1 & Geometry — Circles

Print Worksheet · 20 Problems · Answers at Bottom

SECTION A — Algebra 1 Word Problems

Translate the story into an equation. Define your variable, set up, and solve.

MEMORY KEYS:

DEFINE the variable first | TRANSLATE words → symbols | SOLVE by isolating x | CHECK by plugging back in SUM = + | DIFFERENCE = – | PRODUCT = × | QUOTIENT = ÷ | 'More than' = add | 'Less than' = subtract

Q01 [Very Easy · One-Step Equation]

Sarah has some apples. After eating 3 apples, she has 11 apples left. How many apples did she start with?

Hint: Let x = starting number. 'After eating 3' means subtract.

A) 8

B) 14 ✓

C) 11

D) 33

Q02 [Very Easy · Two Numbers Sum]

Two numbers add up to 20. One number is 6 more than the other. What are the two numbers?

Hint: If one number is x, the other is x + 6. Both must add to 20.

A) 6 and 14

B) 8 and 12

C) 7 and 13 ✓

D) 5 and 15

Q03 [Easy · Rate / Unit Price]

A store sells pens at $2 each. Tom buys some pens and pays $14 in total. How many pens did he buy?

Hint: Rate × quantity = total. This is a division problem.

A) 5

B) 6

C) 7 ✓

D) 8

Q04 [Easy · Age Problem (TRICKY — 'more than' direction!)]

Emma is 3 years older than her brother. The sum of their ages is 19. How old is Emma?

WARNING: Common mistake — forgetting who is older. Emma = brother + 3.

A) 8

B) 11 ✓

C) 9

D) 13

Q05 [Easy · Perimeter Problem]

A rectangle's length is twice its width. The perimeter is 36 cm. What is the width?

Hint: Perimeter = 2l + 2w. Replace l with 2w.

A) 9 cm

B) 6 cm ✓

C) 12 cm

D) 4 cm

Q06 [Easy · Money / Coins (TRICKY — value vs. count!)]

Jake has dimes and nickels totaling $1.20. He has twice as many nickels as dimes. How many dimes does he have?

WARNING: dime = 10¢, nickel = 5¢. Value is NOT the same as count!

A) 4

B) 6 ✓

C) 8

D) 12

Q07 [Medium · Distance = Rate × Time]

A car travels at 60 km/h. How long does it take to travel 210 km?

Formula: $d = r \times t \rightarrow t = d \div r$

A) 3 hours

B) 3.5 hours ✓

C) 4 hours

D) 2.5 hours

Q08 [Medium · Consecutive Integers (TRICKY — read the question!)]

The sum of three consecutive integers is 48. What is the LARGEST of the three integers?

WARNING: The question asks for the LARGEST, not the first! Consecutive = n, n+1, n+2.

A) 15

B) 16

C) 17 ✓

D) 18

Q09 [Medium · Percent / Discount]

A jacket originally costs $80. It is on sale for 25% off. What is the sale price?

WARNING: Don't pick the discount amount ($20)! Sale price = Original – Discount.

A) $20

B) $55

C) $60 ✓

D) $65

Q10 [Medium · Total Earnings (TRICKY — bonus added once, not per hour!)]

Maria earns $12 per hour. She also earned a one-time bonus of $30. If she earned $114 in total, how many hours did she work?

WARNING: The $30 bonus is NOT multiplied by hours — it is added once only!

A) 6 hours

B) 7 hours ✓

C) 8 hours

D) 9.5 hours

SECTION B — Geometry: Circle Problems

Master the vocabulary and formulas, then apply them carefully.

MEMORY KEYS:

RADIUS (r): center to edge | DIAMETER (d = 2r): all the way across | $\pi \approx 3.14$ CIRCUMFERENCE: $C = 2\pi r = \pi d$ | AREA: $A = \pi r^2$ | ARC LENGTH: (angle/360) × $2\pi r$ TANGENT meets radius at 90° | INSCRIBED ANGLE = 1/2 × arc | THALES: diameter → 90° angle

Q11 [Very Easy · Radius vs Diameter]

A circle has a diameter of 10 cm. What is its radius?

Key: DIAMETER = 2 × RADIUS. So RADIUS = DIAMETER ÷ 2.

A) 20 cm
B) 10 cm
C) 5 cm ✓
D) 3.14 cm

Q12 [Very Easy · Circumference (given radius) — use π ≈ 3.14]

Find the circumference of a circle with radius = 7 cm.

Formula: C = 2πr. Do NOT use Area formula (πr²) by mistake!

A) 21.98 cm
B) 43.96 cm ✓
C) 153.86 cm
D) 87.92 cm

Q13 [Easy · Area of a Circle — use π ≈ 3.14]

What is the area of a circle with diameter = 12 cm?

WARNING: Problem gives DIAMETER. Find radius FIRST: r = 12 ÷ 2 = 6. Then A = πr².

A) 37.68 cm²
B) 452.16 cm²
C) 113.04 cm² ✓
D) 75.36 cm²

Q14 [Easy · Find Radius from Circumference — use π ≈ 3.14]

A circle has a circumference of 62.8 cm. What is the radius?

Work backwards: C = 2πr → r = C ÷ (2π). Rearrange the formula!

A) 20 cm
B) 10 cm ✓
C) 5 cm
D) 31.4 cm

Q15 [Easy · Central Angle]

A circle is divided into 4 equal sectors. What is the central angle of each sector?

Key: A full circle = 360°. Divide equally among all sectors.

A) 45°
B) 90° ✓
C) 180°
D) 120°

Q16 [Medium · Arc Length — use π ≈ 3.14]

A circle has radius 9 cm. What is the arc length of a sector with central angle 120°?

Formula: Arc = (angle ÷ 360) × 2πr. Note: 120/360 = 1/3.

A) 56.52 cm
B) 18.84 cm ✓
C) 37.68 cm
D) 9.42 cm

Q17 [Medium · Area of Sector — use π ≈ 3.14]

A pizza has a radius of 10 cm. It is cut into 8 equal slices. What is the area of one slice?

Each slice = 360 ÷ 8 = 45°. Area of sector = (angle ÷ 360) × πr².

A) 78.5 cm²
B) 39.25 cm² ✓

C) 31.4 cm²

D) 19.625 cm²

Q18 [Medium · Tangent Line Theorem (TRICKY concept!)]

A tangent line touches a circle at point P. The radius to point P is 5 cm. What is the angle between the radius and the tangent line?

KEY THEOREM: Tangent ⊥ Radius at point of tangency — ALWAYS 90°, regardless of radius length!

A) 45°

B) 180°

C) 90° ✓

D) Depends on radius length

Q19 [Medium · Inscribed Angle Theorem]

An inscribed angle in a circle intercepts an arc of 80°. What is the measure of the inscribed angle?

WARNING: Inscribed angle = 1/2 × intercepted arc. Many confuse this with central angle = arc!

A) 80°

B) 160°

C) 40° ✓

D) 20°

Q20 [Medium · Thales' Theorem — Angle in Semicircle]

Triangle ABC is inscribed in a circle. AB is the diameter. What is the measure of angle ACB?

THALES' THEOREM: Any angle inscribed in a semicircle (with hypotenuse = diameter) is always 90°!

A) 45°

B) 60°

C) 180°

D) 90° ✓

ANSWER KEY

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

Score: _____ / 20 Name: _____ Date: _____