

Final Test — Form A

Answer key

7.RP

7.NS

7.EE

7.G

7.SP

28 problems

1. Compute $-8 + 5 - (-3)$.

Answer 0 $-8 + 5 = -3$; then $-3 - (-3) = -3 + 3 = 0$.

2. A runner jogs $7\frac{1}{2}$ miles in 3 days at the same distance each day. What is the unit rate in miles per day?

Answer $2\frac{1}{2}$ miles per day $\frac{15/2}{3} = \frac{15}{2} \times \frac{1}{3} = \frac{15}{6} = \frac{5}{2} = 2\frac{1}{2}$ miles per day.

3. Compute $(-6) \times (-4) \div 3$.

Answer 8 $(-6) \times (-4) = 24$ (negative times negative is positive); then $24 \div 3 = 8$.

4. What is 15% of 60?

Answer 9 $15\% = 0.15$, so $0.15 \times 60 = 9$.

5. Compute $-\frac{3}{4} + \frac{1}{2}$. Write the answer in simplest form.

Answer $-\frac{1}{4}$ Common denominator 4: $-\frac{3}{4} + \frac{2}{4} = -\frac{1}{4}$.

6. Solve for x : $3x - 5 = 16$.

Answer $x = 7$ Add 5: $3x = 21$. Divide by 3: $x = 7$.

7. Expand $4(2x + 3)$.

Answer $8x + 12$ Distribute the 4: $4 \times 2x + 4 \times 3 = 8x + 12$.

8. A pair of cleats is marked \$45. The sales tax is 8%. What is the total cost?

Answer \$48.60Tax = $0.08 \times 45 = \$3.60$. Total = $45 + 3.60 = \$48.60$.

9. Compute $\left(-\frac{2}{3}\right) \times \frac{9}{10}$. Write the answer in simplest form.

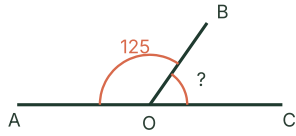
Answer $-\frac{3}{5}$ $\frac{-2 \times 9}{3 \times 10} = \frac{-18}{30} = -\frac{3}{5}$.

10. Factor the expression $6x + 15$ by taking out the greatest common factor.

Answer $3(2x + 5)$

$\gcd(6, 15) = 3$. Factor it out: $6x + 15 = 3(2x + 5)$.

11. In the figure, angles $\angle AOB$ and $\angle BOC$ form a straight line. If $\angle AOB = 125^\circ$, find $\angle BOC$.



Answer 55°

Angles on a straight line are supplementary: $\angle BOC = 180^\circ - 125^\circ = 55^\circ$.

12. Combine like terms: $5x + 8 - 2x - 3$.

Answer $3x + 5$

Combine x -terms: $5x - 2x = 3x$. Combine constants: $8 - 3 = 5$. Result: $3x + 5$.

13. Which expression is equivalent to $-2(3x - 4)$?

Answer B) $-6x + 8$

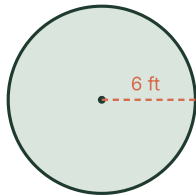
Distribute -2 : $-2 \times 3x = -6x$ and $-2 \times (-4) = +8$, giving $-6x + 8$.

14. Solve the inequality $2x + 3 \leq 11$.

Answer $x \leq 4$

Subtract 3: $2x \leq 8$. Divide by 2: $x \leq 4$.

15. The circle below is the center of the basketball court. Find its circumference and area in terms of π .



Answer $C = 12\pi$ ft; $A = 36\pi$ square ft

Radius $r = 6$ ft. $C = 2\pi r = 12\pi$ ft. $A = \pi r^2 = \pi(6)^2 = 36\pi$ square ft.

16. Compute $-2.4 \div 0.6$.

Answer -4

$\frac{-2.4}{0.6} = \frac{-24}{6} = -4$ (negative divided by positive is negative).

17. On a map, 1 inch represents 25 miles. Two schools are 4.5 inches apart on the map. What is the actual distance between them?

Answer 112.5 miles

Multiply by the scale: $4.5 \times 25 = 112.5$ miles.

18. Solve for x : $\frac{x}{4} + 6 = 10$.

Answer $x = 16$

Subtract 6: $\frac{x}{4} = 4$. Multiply by 4: $x = 16$.

19. The table shows the distance d (in meters) a sprinter runs in t seconds at a constant speed. Write an equation that gives d in terms of t , and state the constant of proportionality.

t	2	4	6
d	16	32	48

Answer $d = 8t$; constant of proportionality = 8

In each column $\frac{d}{t} = \frac{16}{2} = \frac{32}{4} = \frac{48}{6} = 8$, so $d = 8t$ and the constant is 8 meters per second.

20. A spinner is split into 8 equal sections numbered 1 through 8. What is the probability of landing on a number greater than 5?

Answer A) $\frac{3}{8}$

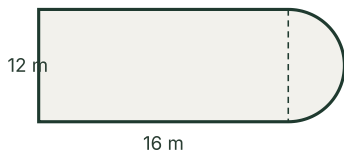
Numbers greater than 5 are 6, 7, 8, that is 3 of the 8 equally likely sections, so $P = \frac{3}{8}$.

21. A \$60 team jacket is discounted 30%. What is the sale price?

Answer \$42

Discount = $0.30 \times 60 = \$18$. Sale price = $60 - 18 = \$42$. (Or $0.70 \times 60 = \$42$.)

22. Find the area of the composite figure below: a rectangle with a semicircle on its right end.



Answer $(192 + 18\pi)$ square m

Rectangle = $16 \times 12 = 192$ square m. The semicircle has diameter 12, so radius 6: area = $\frac{1}{2}\pi(6)^2 = 18\pi$ square m.

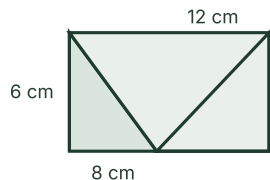
Total = $192 + 18\pi$ square m.

23. Liam opens a savings account with \$400 that earns 5% simple interest per year. How much interest does it earn in 3 years, and what is the balance then?

Answer Interest = \$60; balance = \$460

Simple interest $I = Prt = 400 \times 0.05 \times 3 = \60 . Balance = $400 + 60 = \$460$.

24. Find the volume of the triangular prism below. The triangular base has legs 6 cm and 8 cm.



Answer 288 cubic cm

Base area = $\frac{1}{2} \times 6 \times 8 = 24$ square cm. Volume = base $\times$ length = $24 \times 12 = 288$ cubic cm.

25. A school soccer team played 6 games and scored these numbers of goals: 1, 3, 2, 5, 2, 5. Find the mean and the median number of goals.

Answer Mean = 3; Median = 2.5

Sum = $1 + 3 + 2 + 5 + 2 + 5 = 18$, so mean = $\frac{18}{6} = 3$. Ordered: 1, 2, 2, 3, 5, 5; the two middle values are 2 and 3, so median = $\frac{2 + 3}{2} = 2.5$.

26. A rectangular swimming pool is 25 m long and 12 m wide. On a scale drawing, 2 cm represents 5 m. What are the length and width of the pool in the drawing?

Answer Length = 10 cm; width = 4.8 cm

Scale: $\frac{2 \text{ cm}}{5 \text{ m}} = 0.4 \text{ cm per m}$. Length = $25 \times 0.4 = 10 \text{ cm}$; width = $12 \times 0.4 = 4.8 \text{ cm}$.

27. A coach has \$150 to buy soccer balls that cost \$18 each, plus a fixed \$12 shipping fee. The cost for n balls is $18n + 12$. Write and solve an inequality to find the greatest number of balls she can buy.

Answer $18n + 12 \leq 150$, so $n \leq 7\frac{2}{3}$; she can buy 7 balls

Subtract 12: $18n \leq 138$. Divide by 18: $n \leq \frac{138}{18} = 7\frac{2}{3}$. Since n is a whole number, the greatest is 7 balls.

28. Maya's first three race times average 52 seconds. Her fourth race time is 48 seconds. What is the percent change in her average time after the fourth race? Round to the nearest tenth of a percent.

Answer About a 1.9% decrease

First three total = $3 \times 52 = 156$. New total = $156 + 48 = 204$ over 4 races, so new average = 51 seconds. Percent change = $\frac{52 - 51}{52} = \frac{1}{52} \approx 0.019 = 1.9\% \text{ decrease}$.