

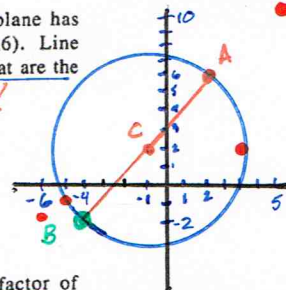
25. $\frac{4.8 \times 10^{-7}}{1.6 \times 10^{-11}} = ?$

- A. 3.0×10^4
- B. 3.0×10^{-4}
- C. 3.0×10^{-18}
- D. 3.2×10^{18}
- E. 3.2×10^4

A. BREAK IT UP
 $\frac{4.8}{1.6} = 3.0$ **POE**
 $\frac{10^{-7}}{10^{-11}} = 10^{-7-(-11)}$
 $= 10^{-7+11}$
 $= 10^4$
B. EXPONENT RULES SUBTRACT
C. CHANGE SIGN AND ADD

26. A circle in the standard (x,y) coordinate plane has center C(-1,2) and passes through A(2,6). Line segment AB is a diameter of this circle. What are the coordinates of point B?

- F. (-6,-2) **NOPE**
- G. (-5,-1) **NOPE**
- H. (-4,-2) **YUP YUP!**
- J. (4, 2) **NOPE**
- K. (5,10) **NOPE**



27. Which of the following expressions is a factor of $x^3 - 64$?

- A. $x - 4$
- B. $x + 4$
- C. $x + 64$
- D. $x^2 + 16$
- E. $x^2 - 4x + 16$

A. NOTICE DIFF = 5
 $x^3 - 64 = (x-4)(x^2 + 4x + 16)$
B. OR LONG DIVISION

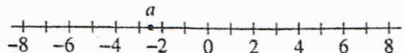
$$\begin{array}{r} x-4 \overline{) x^3 + 0x^2 + 0x - 64} \\ \underline{x^3 - 4x^2} \\ 4x^2 + 0x \\ \underline{4x^2 - 16x} \\ 16x - 64 \\ \underline{16x - 64} \\ 0 \end{array}$$

28. The average of a list of 4 numbers is 90.0. A new list of 4 numbers has the same first 3 numbers as the original list, but the fourth number in the original list is 80, and the fourth number in the new list is 96. What is the average of this new list of numbers?

- F. 90.0
- G. 91.5
- H. 94.0
- J. 94.5
- K. 94.8

A. GET TOT.
 $4 \times 90 = 360$
B. SUBT
 $360 - 80 = 280$
C. ADD
 $280 + 96 = 376$
D. DIVIDE BY 4
 $376 \div 4 = 94$

29. The number a is located at -2.5 on the number line below.



One of the following number lines shows the location of a^2 . Which number line is it?

- A.
- B.
- C.
- D.
- E.

A. LABEL
 $a = -2.5$
 $a^2 = (-2.5)^2 = 6.25$

30. Maria ordered a pizza. She ate only $\frac{2}{9}$ of it and gave the remaining pizza to her 3 brothers. What fraction of the whole pizza will each of Maria's brothers receive, if they share the remaining pizza equally?

- F. $\frac{7}{9}$
- G. $\frac{3}{7}$
- H. $\frac{1}{3}$
- J. $\frac{7}{27}$
- K. $\frac{2}{27}$

A. LABEL
 $MARIA = \frac{2}{9}$ SO 3 BROS = $\frac{7}{9}$
B. DIVIDE BY 3 BROS
 $\frac{7}{9} \div 3 = \frac{7}{9} \cdot \frac{1}{3} = \frac{7}{27}$

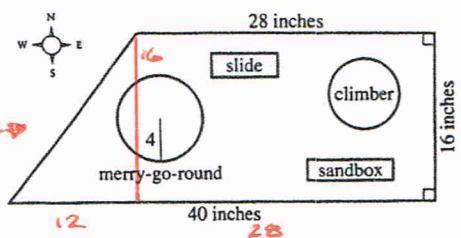
31. The number 1,001 is the product of the prime numbers 7, 11, and 13. Knowing this, what is the prime factorization of 30,030?

- A. $3 \cdot 7 \cdot 10 \cdot 13$
- B. $30 \cdot 7 \cdot 11 \cdot 13$
- C. $2 \cdot 5 \cdot 7 \cdot 11 \cdot 13$
- D. $3 \cdot 7 \cdot 10 \cdot 11 \cdot 13$
- E. $2 \cdot 3 \cdot 5 \cdot 7 \cdot 11 \cdot 13$

A. NOTICE FACTOR
 $30,030 = 30(1001)$
 $2 \cdot 3 \cdot 5 \cdot 7 \cdot 11 \cdot 13$

Use the following information to answer questions 32-34.

Mikea, an intern with the Parks and Recreation Department, is developing a proposal for the new trapezoidal Springdale Park. The figure below shows her scale drawing of the proposed park with 3 side lengths and the radius of the merry-go-round given in inches. In Mikea's scale drawing, 1 inch represents 1.5 feet.



32. What is the area, in square inches, of the scale drawing of the park?

- F. 448
- G. 544
- H. 640
- J. 672
- K. 1,088

A. BREAK IT UP
 $\frac{1}{2}(12)(16) = 96$
 $28(16) = 448$
B. ADD
 $96 + 448 = 544$
C. FORMULA
 $\frac{(28+40)}{2} \times 16 = 544$

33. Mikea's proposal includes installing a fence on the perimeter of the park. What is the perimeter, in feet, of the park?

- A. 84
- B. 88
- C. 104
- D. 126
- E. 156

A. FIND MISSING SIDE
B. ADD UP SIDES
 $28 + 16 + 40 = 84$
C. RATIO
 $\frac{I}{1} = \frac{F}{1.5}$
 $104 : X$
 $X = 156$

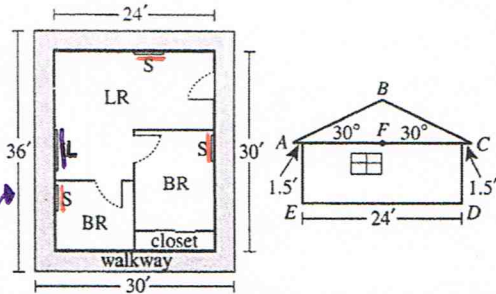
34. The length of the south side of the park is what percent of the length of the north side?

- F. 112%
- G. 124%
- H. $142\frac{2}{7}\%$
- J. 175%
- K. 250%

A. FOLLOW RECIPE OF QUESTION
 $\frac{S}{N} = \frac{40}{28} = 1.428 \approx 142\frac{2}{7}\%$
B. CONVERT DECIMAL TO PERCENT

Use the following information to answer questions 35-37.

The Smith family is planning to build a 3-room cabin which consists of 2 bedrooms (BR) and 1 living room (LR). Shown below are the rectangular floor plan (left figure) and a side view of the cabin (right figure). In the side view, the roof forms an isosceles triangle ($\triangle ABC$), the walls are perpendicular to the level floor (\overline{ED}), $\overline{AC} \parallel \overline{ED}$, F is the midpoint of \overline{AC} , and $\overline{BF} \perp \overline{AC}$.



During the week the Smiths plan to roof the cabin, there is a 20% chance of rain each day.

35. Mr. Smith plans to build a 3-foot-wide walkway around the outside of the cabin, as shown in the floor plan. What will be the area, in square feet, of the top surface of the walkway?

- A. 171
 - B. 324
 - C. 360
 - D. 396
 - E. 720
- A. AREA OF WHOLE** $36 \times 30 = 1080$
B. SUBTRACT AREA OF HOUSE $30 \times 24 = 720$
360

36. Mrs. Smith will install a ceiling fan in each room of the cabin and will place curtains over the 4 windows. Each of the ceiling fans has a price of \$52.00. The price of curtains for each small window (S) is \$39.50 and the price of curtains for the large window (L) is twice that for the small window. Based on this information, which of the following values is closest to the total price Mrs. Smith will pay for curtains and ceiling fans?

- F. \$262
 - G. \$302
 - H. \$341
 - J. \$354
 - K. \$393
- A. CAREFULLY LABEL** $CF = 3 \times 52.00 = 156.00$
 $SW = 3 \times 39.50 = 118.50$
 $LW = 1 \times 79.00 = 79.00$
353.50

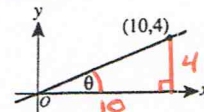
37. Mr. and Mrs. Smith plan to roof the cabin on 2 consecutive days. Assuming that the chance of rain is independent of the day, what is the probability that it will rain both days?

- A. 0.04
 - B. 0.08
 - C. 0.16
 - D. 0.20
 - E. 0.40
- A. MULTIPLY** $(.2 \times .2) = .04$
OR $(\frac{1}{5} \times \frac{1}{5}) = \frac{1}{25} = .04$

SIDE NOTE:
 IF IT ASKED PROBABILITY IT WILL RAIN ON "EITHER" DAY OR "OR", THEN ADD
 $.2 + .2 = .4$ OR $\frac{1}{5} + \frac{1}{5} = \frac{2}{5}$

38. Which of the following expressions, when evaluated, equals an irrational number?
- F. $\frac{\sqrt{2}}{\sqrt{8}} \cdot \frac{\sqrt{8}}{\sqrt{8}} = \frac{\sqrt{2}}{8} = \frac{1}{8} = \frac{1}{2}$ RATIONAL
 - G. $\frac{\sqrt{8}}{\sqrt{2}} \cdot \frac{\sqrt{2}}{\sqrt{2}} = \frac{\sqrt{16}}{2} = \frac{4}{2} = 2$ RATIONAL
 - H. $(\sqrt{8})^2 = 8$ RATIONAL
 - J. $\sqrt{2} \times \sqrt{8} = \sqrt{16} = 4$ RATIONAL
 - K. $\sqrt{2} + \sqrt{8}$ **CAN'T DO NUFFIN!**

39. A line through the origin and (10,4) is shown in the standard (x,y) coordinate plane below. The acute angle between the line and the positive x-axis has measure θ . What is the value of $\tan \theta$?



- A. $\frac{\sqrt{29}}{2}$
 - B. $\frac{2}{\sqrt{29}}$
 - C. $\frac{5}{\sqrt{29}}$
 - D. $\frac{2}{5}$
 - E. $\frac{5}{2}$
- A. MARK IT!**
B. SOHCAHTOA
 $\frac{O}{A} = \frac{4}{10} = \frac{2}{5}$

- SLICKERY**
40. The equation $|2x - 8| + 3 = 5$ has 2 solutions. Those solutions are equal to the solutions to which of the following pairs of equations?
- F. $2x - 5 = 5$
 $-2x - 5 = -5$
 - G. $2x - 8 = 2$
 $-2x - 8 = 2$
 - H. $2x - 8 = 8$
 $-(2x - 8) = 8$
 - J. $2x - 8 = 2$
 $-(2x - 8) = 8$
 - K. $2x - 8 = 2$
 $-(2x - 8) = 2$
- A. SUBTRACT 3 FROM BOTH SIDES** $|2x - 8| = 2$
B. SOLVE FOR ABS. VAL. $2x - 8 = 2$ OR $2x - 8 = -2$
 $-(2x - 8) = 2$

41. The frequency chart below shows the cumulative number of Ms. Hernandez's science students whose test scores fell within certain score ranges. All test scores are whole numbers.

Score range	Cumulative number of students
65-70	12
65-80	13
65-90	19
65-100	21

B. SOLVE IF 65-70 HAVE 12 AND 65-80 HAVE 13 THEN 71-80 MUST HAVE

- How many students have a test score in the interval 71-80?
- A. 1
 - B. 6
 - C. 8
 - D. 12
 - E. 13
- C. SUBTRACT** $13 - 12 = 1$