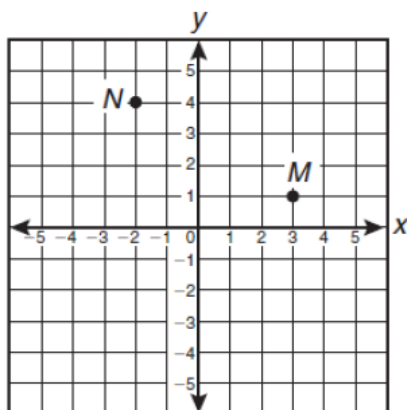# Arizona's Instrument to Measure Standards (AIMS HS)

Mathematics

Released Items

September 7, 2010

1 What is the distance between points *M* (3, 1) and *N* (−2, 4) on the graph below?

A $\sqrt{10}$

B $\sqrt{26}$

C $\sqrt{34}$

D $\sqrt{50}$

2 Which set of numbers represents an infinite set?

A {natural numbers}

B {integers between 5 and 20}

C {1, 2, 3}

D $\left\{\dfrac{1}{2}, \dfrac{1}{3}, \dfrac{1}{4}, \dfrac{1}{5}\right\}$

3 Earth's mean temperature is 59°F, and it is 9.3×10^7 miles from the sun. Mars' mean temperature is −85°F, and it is 141.6×10^6 miles from the sun. Which matrix represents these data?

A

	Temp.	Distance
Earth	59	9.3×10^7
Mars	−85	141.6×10^6

B

	Temp.	Distance
Earth	59	141.6×10^6
Mars	−85	9.3×10^7

C

	Temp.	Distance
Earth	−85	9.3×10^7
Mars	59	141.6×10^6

D

	Temp.	Distance
Earth	−85	141.6×10^6
Mars	59	9.3×10^7

Go On ➡

4 Which statement has a true converse?

A If a quadrilateral is a square, then it is a rectangle.

B If two angles are vertical angles, then they are congruent.

C If two angles form a linear pair, then they are supplementary.

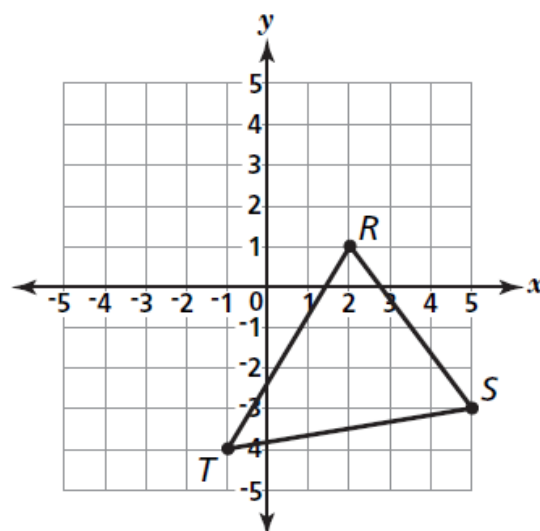D If an angle is a right angle, then it measures exactly 90⁰.

5 Trapezoid *JKLM* is shown below.
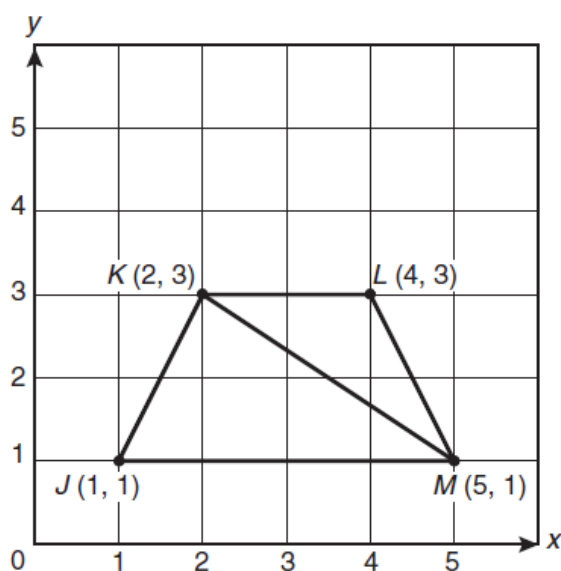
What is the length of $\overline{KM}$?

A $\sqrt{5}$

B $\sqrt{13}$

C $\sqrt{65}$

D $\sqrt{73}$

6 Study △*RST* on the grid below.

When △*RST* is translated 4 units down, what are the apparent coordinates of *T'* ?

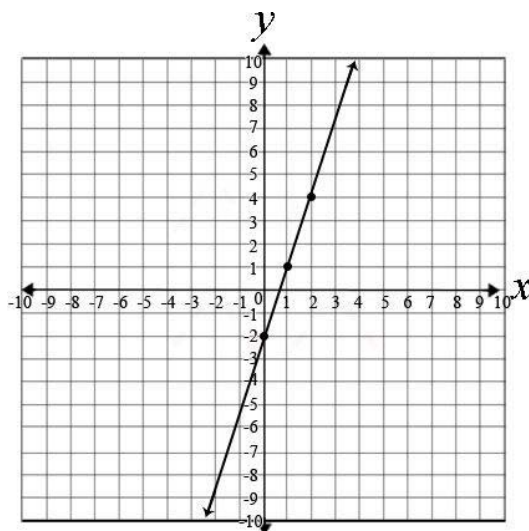A $(-8, -1)$

B $(-4, -1)$

C $(-1, -8)$

D $(0, -4)$

7 The coach wants to introduce each of the starting players at Tuesday's game. In how many different orders can each of the 5 starting players be introduced?
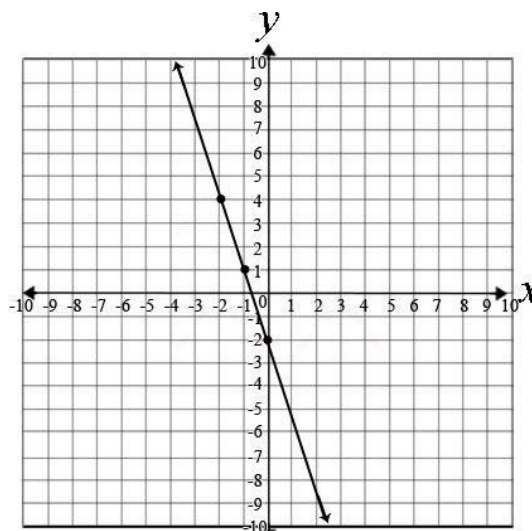
A 120

B 25

C 15

D 5

Go On
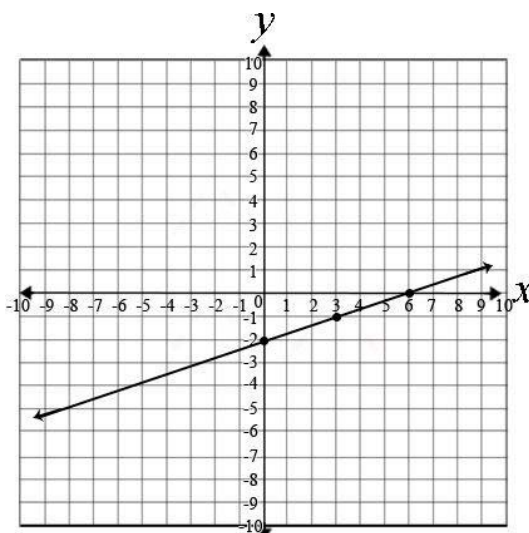
8 Which could be the graph of the equation below?

$$y = \frac{1}{3}x - 2$$
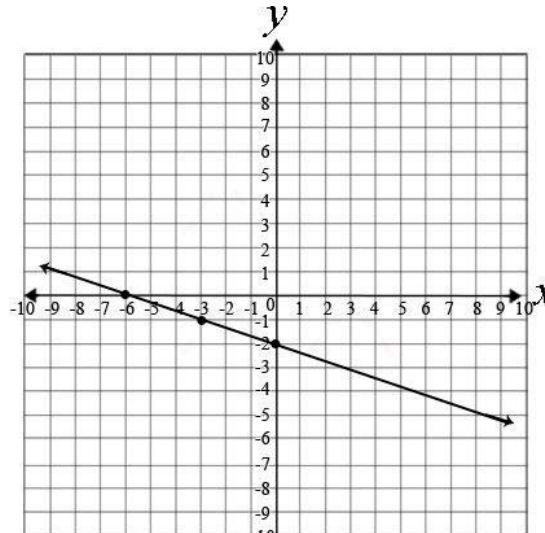

A

C

B

D

Go On ➡️

9 Which equation represents the data in the table?

n	C
10	70
20	100
30	130
40	160

A $C = 3n + 40$

B $C = -3n - 40$

C $C = 3n - 100$

D $C = -3n + 100$

10 Which expression is the nth term of the quadratic sequence shown in the table below?

Term No.	1	2	3	4	5
Value	1	4	9	16	25

A n^2

B $2n^2$

C $n^2 + 3$

D $2n^2 + 2$

11 A committee consisting of 5 teachers will be chosen from a staff of 25 teachers. To find the number of different possible 5-teacher committees, which should be used?

A combination, because the order is important.

B permutation, because the order is important.

C combination, because the order is not important.

D permutation, because the order is not important.

12 Bob created a number pattern beginning with 3. He created the next term by doubling the previous term and subtracting 1. The first 5 terms of the number pattern are shown below.
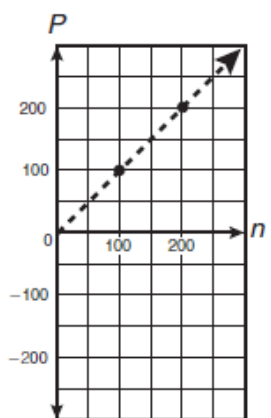
3, 5, 9, 17, 33, . . .

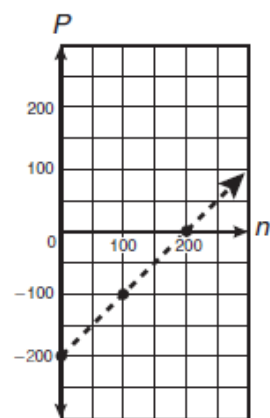What is the 7th term in Bob's number pattern?
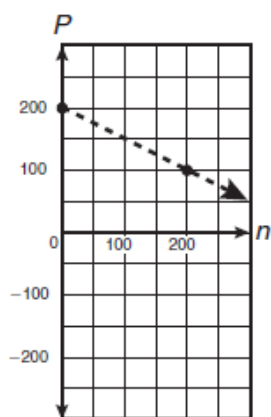
A 51

B 65

C 129

D 257

Go On ▶

13 Student council members plan to sell shaved-ice cones to raise funds. They will spend $200.00 for supplies and will charge $1.00 for each shaved-ice cone. Which graph represents P, their profit, as a function of n, the number of cones sold?
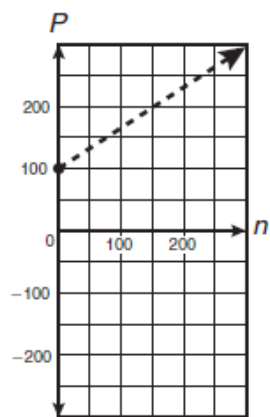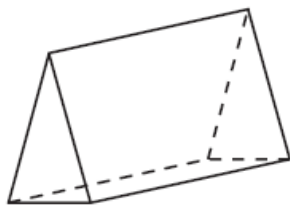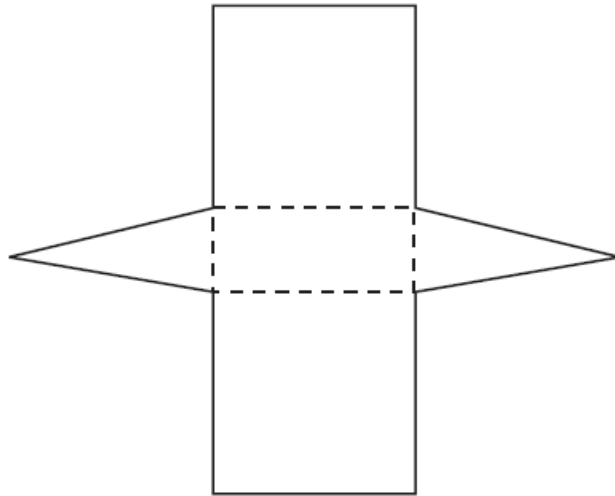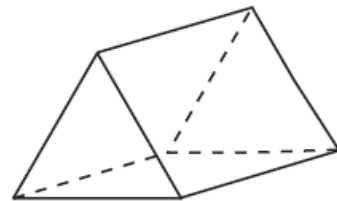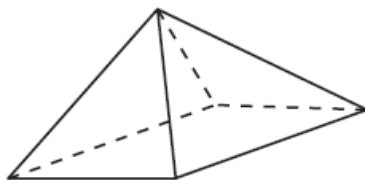

A

C

B

D

Go On ▶

14 Which 3-dimensional object can be formed by folding the net along the dashed segments and taping the edges?

A

C

B

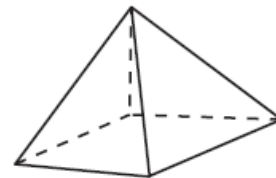**D**

Go On ➡

15 What is the value of the expression below when $a = -4$ and $b = 3$?
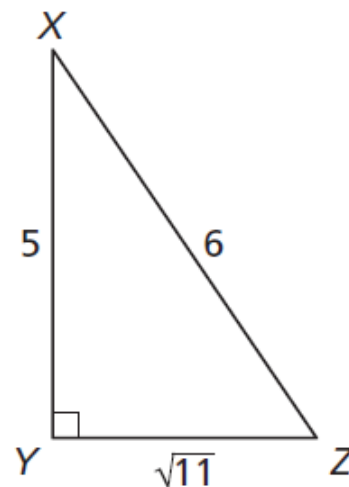
$$a^2 + |ab|$$

A -4

B -28

C 4

D 28

16 A polygon has been rotated about the origin. Which statement must be true?

A   The lengths of the sides are doubled.

B   The area of the polygon did not change.

C   The coordinates of the vertices did not change.

D   The area of the polygon is 4 Times its original area.
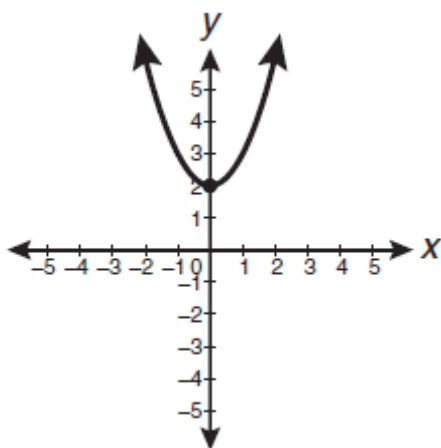
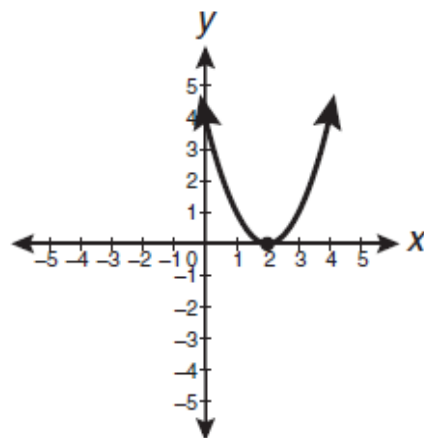**17** Study the triangle below.

What is the cosine of $\angle X$?

A $\dfrac{5}{6}$

B $\dfrac{\sqrt{11}}{6}$

C $\dfrac{\sqrt{11}}{5}$

D $\dfrac{6}{5}$

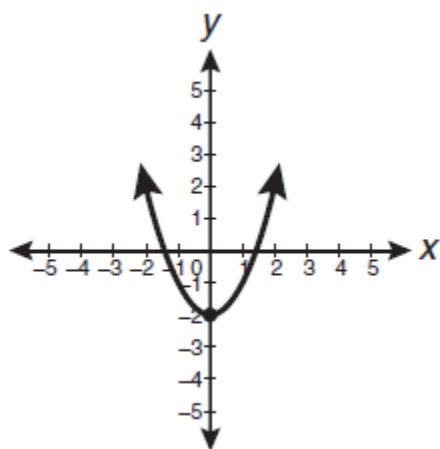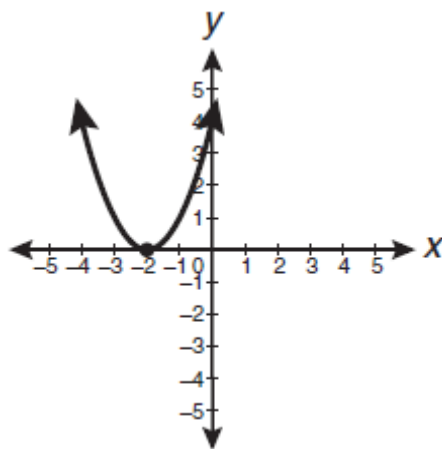**Go On** ➡

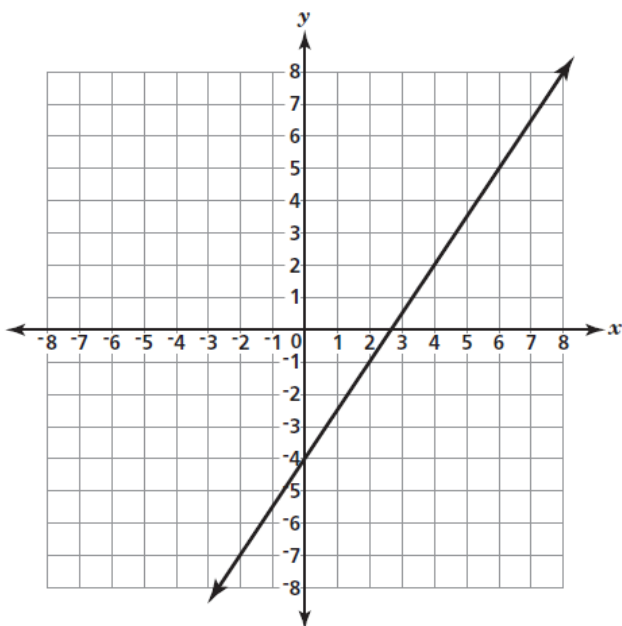**18** Which is the graph of $y = x^2 + 2$?

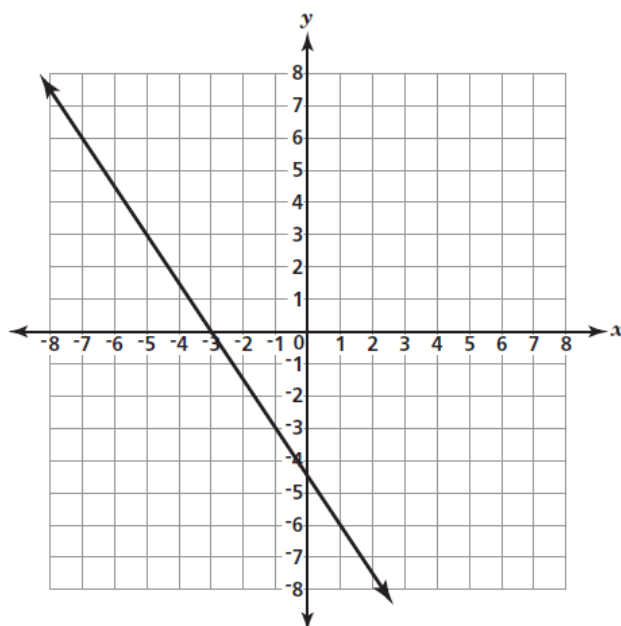
A

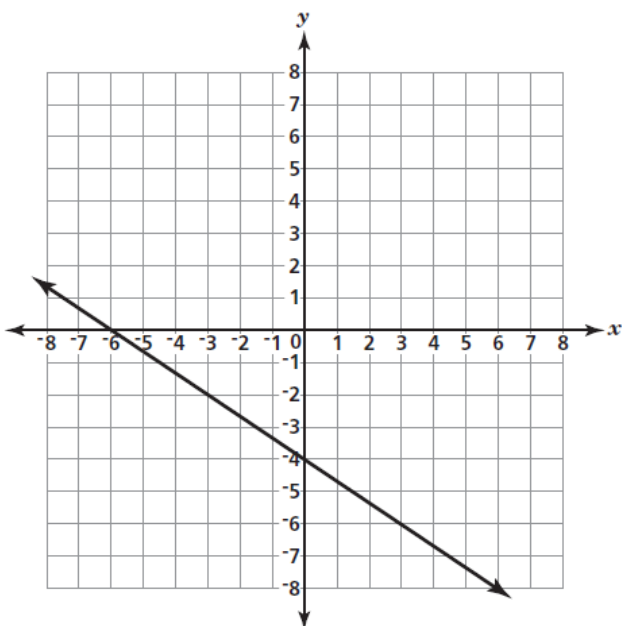**C**

B

D

Go On ➡️

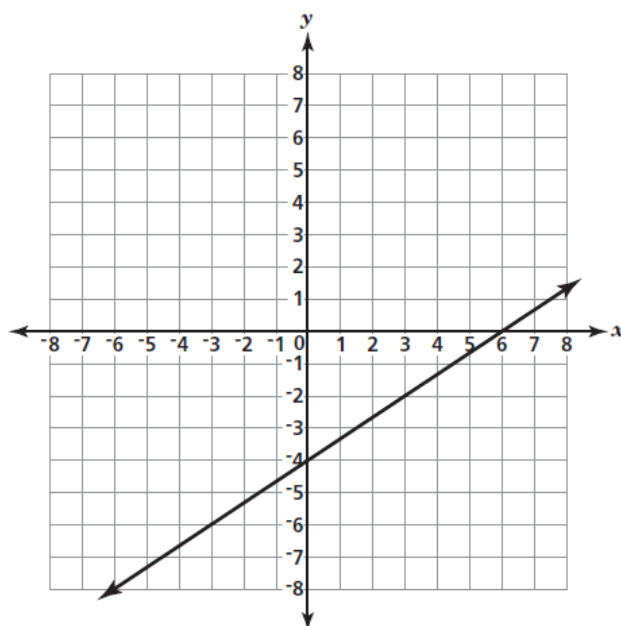**19** Which is the apparent graph of $y = \frac{2}{3}x - 4$?

A

C

B

D

Go On ▶

20 The formula for the lateral area of a pyramid is $A = \frac{1}{2}pl$. What is p in terms of A and l?

A $p = \frac{2A}{l}$

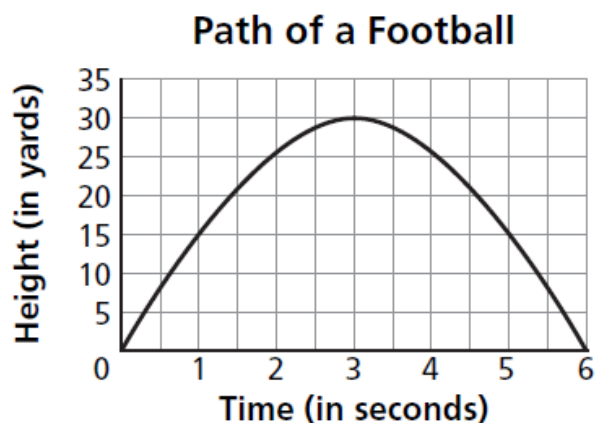B $p = A - \frac{1}{2}l$

C $p = 2A - l$

D $p = \frac{1}{2}Al$

21 The rule for a particular number pattern is to multiply the immediately preceding term by 2 and then add 1. The first four terms of this number pattern are given below.

$$-2, -3, -5, -9, \ldots$$

What is the 6th term of the number pattern?

A −35

B −33

C −18

D −17

22 The graph below shows the path of a football that was kicked during a game.
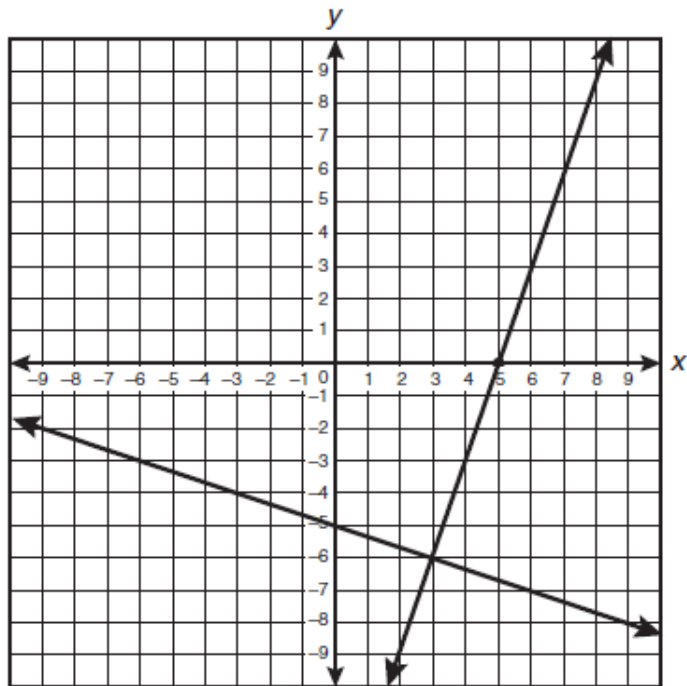
Path of a Football

What was the maximum height of the football during the kick?

A 3 yards

B 6 yards

C 30 yards

D 35 yards

Go On ➡️

23 What is the apparent solution to the system of equations graphed below?

**A** (−6, 3)

B (0, −5)

C (3, −6)

D (5, 0)

24 Three transformations will be performed on triangle *ABC*. Which set of transformations will always produce a congruent triangle?

A dilation, rotation, translation

B reflection, dilation, translation

C rotation, reflection, dilation

D rotation, translation, reflection

Go On ➡️

25 The stem-and-leaf plot below shows test scores for 25 students.

Test Scores

Stem	Leaf
5	3 5 7
6	2 4 6 8 9
7	1 3 3 5 5 5 6 7 8
8	1 1 3 5 8
9	1 2 8

KEY
5|3 = 53
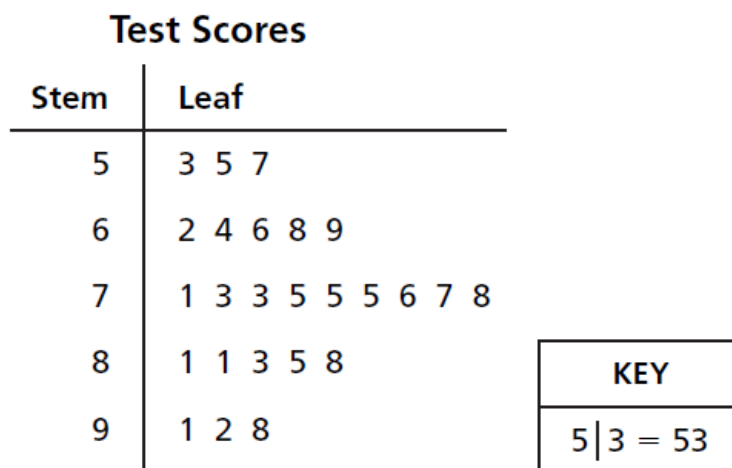
Which box-and-whisker plot **correctly** displays the data in the stem-and-leaf plot?

A

B

C

D
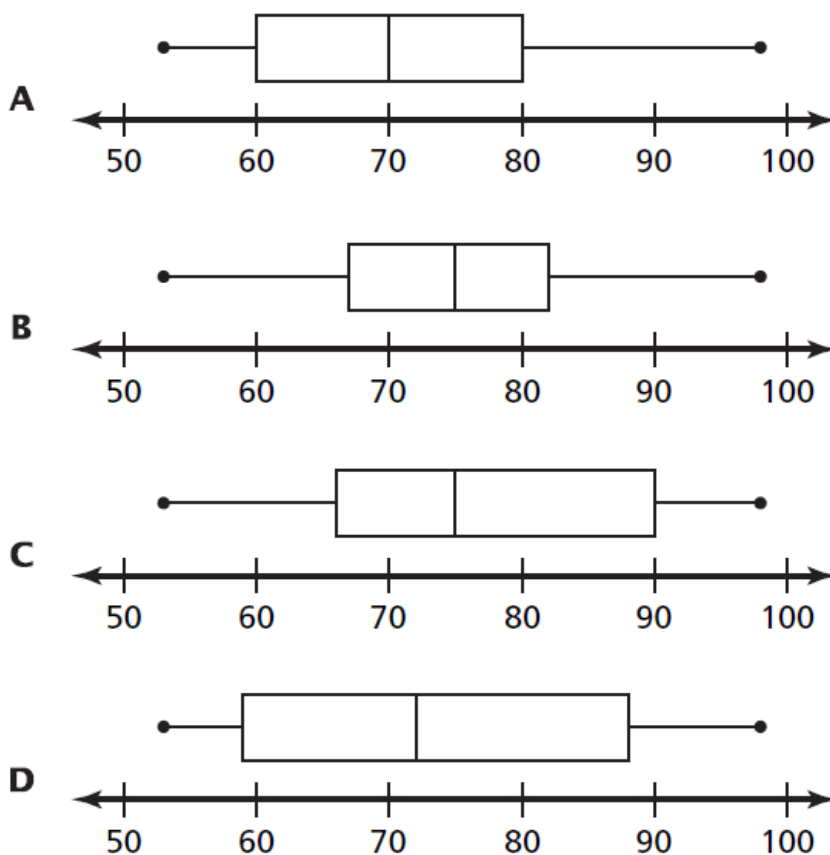
Go On ➡

26 Study the proportion below.

$$\frac{-2}{x - 7} = \frac{5}{x + 21}$$

What value of x makes the proportion true?

A -4

B -1

C   11

D   13

27 A teacher must select 2 students from a list of 4 students. How many distinct groups of 2 students are possible?

A   4

B   6

C   8

D   12

28 Study the quadratic equation below.

$$2x^2 + 3x - 20 = 0$$

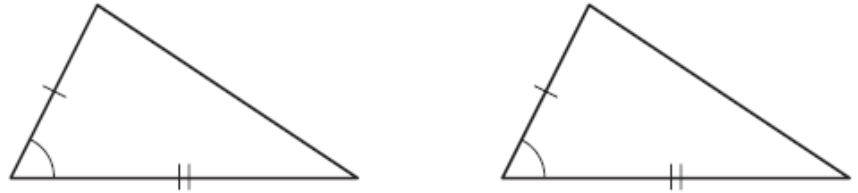Which of the following shows two solutions to the equation?

A   4 and $-\frac{5}{2}$

B   2 and -5

C -4 and $\frac{5}{2}$

D   5 and -2

29 Which of the following does **not** show a close approximation?

A $\sqrt{18} \approx 4.2$

B $\sqrt{23} \approx 11.5$

C $\sqrt{62} \approx 7.9$

D $\sqrt{80} \approx 8.9$

Go On ➡

30 Jan proved that the two triangles below are congruent.

Which postulate did Jan use for her proof?

A SSS (Side-Side-Side)

B SAS (Side-Angle-Side)

C AAS (Angle-Angle-Side)

D ASA (Angle-Side-Angle)

Stop 🛑