I. Diagnostic Test

Answer Sheet

Section 1

1	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ
2	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ
3	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ
4	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ
5	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ
6	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ
7	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ
8	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ
9	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ
10	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ
11	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ
12	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ
13	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ
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15	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ
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17	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ
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19	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ
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21	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ
22	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ
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25	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ
26	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ
27	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ
28	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ

Section 2

1	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ
2	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ
3	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ
4	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ
5	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ
6	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ
7	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ
8	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ
9	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ
10	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ
11	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ
12	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ
13	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ
14	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ
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16	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ
17	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ
18	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ
19	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ
20	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ

21	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ
22	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ
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26	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ
27	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ
28	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ
29	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ
30	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ
31	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ
32	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ
33	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ
34	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ
35	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ
36	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ
37	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ
38	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ
39	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ
40	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ

41	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ
42	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ
43	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ
44	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ

45 _____

46 _____

47 _____

48 _____

49 _____

50 _____

Section 1: Verbal

Directions: Each of the following questions gives you a related pair of words or phrases. Select the lettered pair that best expresses a relationship similar to that in the original pair of words.

1. DEPOSE : CZAR ::

   A. checkmate : chess player
   B. howl : watchdog
   C. charge : employee
   D. manuscript : writer
   E. operate : doctor

2. TACTLESS : SENSITIVITY ::

   A. penurious : generosity
   B. imperturbable : assurance
   C. aggrieved : composure
   D. craven : cowardice
   E. bellicose : fear

3. ALTRUISM : LIBERALITY ::

   A. levity : stupidity
   B. autonomy : independence
   C. probity : dishonesty
   D. belief : temerity
   E. privation : suffering

4. NOSTAGLIA : PAST ::

   A. regret : deed
   B. yearning : eternity
   C. anticipation : future
   D. absence : presence
   E. memory : forgetfulness

5. SYCOPHANT : SINCERITY ::

   A. thief : cleverness
   B. deceiver : truth
   C. coward : fear
   D. friend : loyalty
   E. hero : courage

6. ASCETIC : PLEASURE ::

   A. politician : votes
   B. plant : light
   C. scientist : truth
   D. planner : water
   E. hermit : society

7. SQUARE : DIFFERENCES ::

   A. arbitrate : conflicts
   B. cast : fracture
   C. antagonize : amities
   D. compromise : negotiations
   E. forgive : troubles

8. TRAVAIL : CRY ::

   A. exercise : play
   B. lumber : toil
   C. malady : ail
   D. encore : join
   E. vacation : travel

Directions: Each blank in the following sentences indicates that something has been omitted. Considering the lettered words beneath the sentence, choose the word or set of words that best fits the whole sentence.

9. The _____ theory was one that not many people understand even though it gained gradual acceptance and picked up more supporters _____.

   A. arcane . . . incrementally
   B. proven . . . regularly
   C. known . . . esoterically
   D. disputable . . . mercurially
   E. protean . . . slowly

10. A _____ toward _____ acts occurs when one saves dollar by dollar each day during turbulent economic times.

    A. tendency . . . parsimonious
    B. ascription . . . greed
    C. asking . . . illiberal
    D. feeling . . . frugal
    E. thought . . . penurious

11. Despite a _____ effort, he had not understood the _____ meaning even after the hardest mental labor.

    A. tiring . . . innocuous
    B. laborious . . . obtuse
    C. protracted . . . liberal
    D. limited . . . frugal
    E. thoughtful . . . obvious

12. The novel's review was _____; it exaggerated minor faults and gave no credit at all for the author's style and humor.

    A. hypothetical
    B. hyperactive
    C. hypersensitive
    D. hyperbolic
    E. hyperopic

13. To the advocates of _____, the best form of government has no governing powers at all as opposed to a constitutional _____ in which the power of the king or queen is usually limited by a constitution and a legislature.

    A. anarchy . . . monarchy
    B. monarchy . . . oligarchy
    C. chaos . . . oligarchy
    D. patriarchy . . . monarchy
    E. anarchy . . . hierarchy

14. The iridescent acrobat gave a _____ performance despite irate opponents who tried to _____ him with false accusations of steroid use and improper conduct.

    A. incredible . . . accuse
    B. sparkling . . . flay
    C. excessive . . . malign
    D. proportionate . . . slander
    E. balanced . . . disparage

15. Even though it was so unlikely he would achieve his _____ goals, they appealed to his sense of _____.

    A. quixotic . . . romance
    B. irritating . . . fair play
    C. unrealistic . . . pragmatism
    D. ephemeral . . . humor
    E. realistic . . . whimsy

16. Pablo Picasso's painting *Guernica* portrays _____ Spanish citizens of a small city with machine gunfire _____ away and bombs blowing up, killing thousands of innocent people.

A. unprotected . . . gunning
B. frail . . . detonating
C. defenseless . . . strafing
D. strong . . . striving
E. formidable . . . powering

Directions: Each word in capital letters is followed by five words or phrases. The correct choice is the word or phrase whose meaning is most nearly *opposite* the meaning of the word in capitals. You may be required to distinguish fine shades of meaning. Look at all choices before marking your answer.

17. MYOPIA

A. hypersensitivity
B. hyperopia
C. hypertrophy
D. farsightedness
E. utopia

18. EXOTERIC

A. wild
B. exotic
C. esoteric
D. urgent
E. perfidious

19. ALLOPATHY

A. antipathy
B. hyperactivity
C. homeopathy
D. impertinence
E. irrelevance

20. LIST

A. strive for
B. stand erect
C. falter
D. omit
E. prioritize

21. PINCHBECK

A. alloy
B. heroism
C. genuine
D. counterfeit
E. copper

22. CHUTZPAH

A. quick-tempered
B. diffidence
C. disconcerted
D. therapeutic
E. aggrieved

23. RECONDITE

A. abstruse
B. erudite
C. understandable
D. obtuse
E. seismic

Directions: Questions follow each of the passages. Using only the stated or implied information in each passage, answer the questions.

Passage 1

The Vietnam War began in 1956 and ended in 1975. It had dire consequences for millions of Americans. The American military pushed forward to South Vietnam to assist its government against the communist regime, who were supported by North Vietnam. By the late 1960s, the United States entered this war in which almost 60,000 Americans would die. Two million Vietnamese lives may have been lost, including those of many thousands of civilians, due to intensive bombing by the opponents. Also, a highly toxic chemical caused defoliation, the elimination of vegetation. The Vietnam War is estimated to have cost approximately $200 billion.

Vietnam veterans, approximately 2.7 million in all, did not receive a positive welcome from American civilians. Instead, they returned to widespread public opposition. Their moral opposition to the war made it difficult for many Americans to show support for these veterans.

A few years after the Vietnam War, veterans started a fund for construction of a memorial to those who had died; they raised nearly $9 million. A competition was held for the proper design, with the proviso that the memorial should not express any political view of the war.

In a funerary design course at Yale University, 21-year-old architecture student Maya Lin submitted a proposal for the design competition for the memorial. The popular conception of a war memorial recalled the heroic equestrian statues of Civil War generals, but in Lin's opinion, such representations

were too simplified. Her design consisted of two walls of polished black granite built into the earth, set in the shape of a shallow V. Carved into the stone are the names of all the men and women killed in the war or still missing, in chronological order by the date of their death or disappearance. Rising up 10 feet high, the names begin and continue to that wall's end, resuming at the point of the opposite wall and ending at the place where the names began. Visitors can easily access the wall and touch the names, an integral part of Lin's design.

After the judges evaluated thousands of entries for this competition in the spring of 1981, Maya Lin won. The public's reaction to this particular design was sharply divided, reflecting their opposing feelings about this war. Thus, a bronze statute of three larger-than-life soldiers was placed near the entrance; a second statute, of three servicewomen, was added later to silence critical opposition. Maya Lin's wall was dedicated in 1982. The Vietnam memorial attracts over a million visitors annually.

24. What is the author's primary purpose of the passage?

A. To propose ideas about Maya Lin's submission from Yale University
B. To dissect the Vietnam Memorial's proposition
C. To discuss the design competition for the Vietnam Memorial and its effects on American society
D. To critique the judges reviewing Lin's sculptural proposal
E. To discuss the history of the Vietnam war and its opposition in America

25. Based on this passage, how do you know that the war did not end in appeasement?

A. The war memorial is inscribed with this fact.
B. Many were killed during the debacle of the war's final days.
C. The animosity between its opponent and supporters created tension.
D. The competition highlighted how the war ended.
E. The war veterans did not receive a hero's welcome.

26. What details in the narrative suggest that it was possible to fulfill the requirement that the monument express no political view of the war?

A. Those opposing it said it degraded the memory of those who had given their lives to this cause.
B. The United States government wanted a memorial that would honor the dead.
C. Carved into the stone are the names of all the men and women killed in the war or still missing, in chronological order by the date of their death or disappearance.
D. One wall points toward the Washington Monument and the other wall points toward the Lincoln Memorial, bringing the Vietnam Memorial into proper historical reference.
E. Many Americans were unwilling to confront the war's many painful issues.

Passage 2

Alfred Tennyson was born August 6, 1809, at Somersby, a little village in Lincolnshire, England. His father was the rector of the parish; his mother, whose maiden name was Elizabeth Fytche, and whose character he touched in his poem "Isabel," was the daughter of a clergyman; and one of his brothers, who later took the name of Charles Turner, was also a clergyman. The religious nature in the poet was a constant element in his poetry, secrets to an observation that was singularly keen, and a philosophic reflection that made Tennyson reveal in his poetry an apprehension of the laws of life, akin to what Darwin was disclosing in his contemporaneous career.

In his early "Ode to Memory," Tennyson has translated into verse the consciousness that woke in him in the secluded fields of his Lincolnshire birthplace. For companionship, he had the large circle of his home, for one of eight brothers and four sisters; and in that little society there was not only the miniature world of sport and study, but a very close companionship with the large world of imagination.

Frederick Tennyson was already at Cambridge when Charles and Alfred went to that university in 1828 and were matriculated at Trinity College. Alfred Tennyson acquired there, as so many other notable Englishmen, not only intellectual discipline, but that close companionship with picked men that is engendered by the half-monastic seclusion of the English university.

Tennyson regarded his post as Poet Laureate in the light of a high poetic and patriotic ardor. Starting with his first laureate poem "To the Queen," the record of Tennyson's career from this time forward is marked by the successive publication of his works.

27. According to the passage, what role does religion play in Tennyson's poetry?

- **A.** It plays a significant role and is a subtle reference in many profound poems.
- **B.** It is a constant evocation in Tennyson's poetry based on nature.
- **C.** It plays a significant role based on religious nature and observation.
- **D.** It does not play a crucial role, even though Tennyson grew up among clergymen as relatives.
- **E.** Religion was studied at Trinity College and weaved into verse at that time.

28. It can be inferred from the passage that the author regards Tennyson as:

- **A.** Living a monastic style life with a society of intellectuals
- **B.** Being influenced by his family's role in society and religion as well as the patriotic fervor of peers
- **C.** Being influenced by his family's religious nature
- **D.** Being influenced by his peers at university
- **E.** Producing patriotic poetry that overrides the poetry's religious nature

IF YOU FINISH BEFORE TIME IS CALLED, CHECK YOUR WORK ON THIS SECTION ONLY. DO NOT WORK ON ANY OTHER SECTION IN THE TEST.

Section 2: Quantitative

Numbers: All numbers used are real numbers.

Figures: Figures are intended to provide useful positional information, but they are not necessarily drawn to scale. Unless a note states that a figure is drawn to scale, you should not solve these problems by estimating sizes or by measurement. Use your knowledge of math to solve the problem. Angle measures can be assumed to be positive. Lines that appear straight can be assumed to be straight. Unless otherwise indicated, figures lie in a plane.

Directions (1–16): You are given two quantities, one in Column A and one in Column B. You are to compare the two quantities and choose:

A if the quantity in Column A is greater
B if the quantity in Column B is greater
C if the two quantities are equal
D if the relationship cannot be determined from the information given

---

x and y are integers greater than 0.

$$\left(\frac{x}{y}\right)^2 > \frac{x}{y} \text{ and } \left(\frac{y}{x}\right)^2 < \frac{y}{x}$$

	Column A	Column B
1.	x	y

$$2.07 = \frac{x}{100}$$

	Column A	Column B
2.	x	270

The number 4.2953 is to be rounded to the nearest thousandth.

	Column A	Column B
3.	The digit in the thousandths place of the rounded number	The digit in the hundredths place of the rounded number

$$3 < a < b < 4$$

	Column A	Column B
4.	$33\frac{1}{3}\%$ of a	25% of b

$$\frac{n}{5} = \frac{p}{3}$$

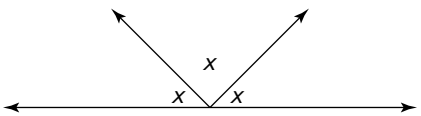
	Column A	Column B
5.	$\frac{n+1}{5}$	$\frac{p+1}{3}$

Five times the difference between a and b is 25.

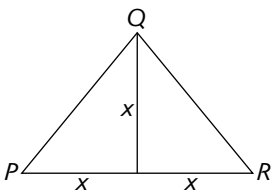
	Column A	Column B
6.	Six times the difference between a and b	36

$$n \geq 0$$

	Column A	Column B
7.	$\sqrt{n^2}$	$\left(\sqrt{n}\right)^2$



	Column A	Column B
8.	x	90



	Column A	Column B
9.	The area of $\triangle PQR$	Half the area of a circle of radius x

	Column A	Column B
10.	The length of a side of a square whose perimeter is 24	The length of the longer side of a rectangle whose perimeter is 24

A and B are points in the coordinate plane. A = $(-x, y)$ and B = $(x, -y)$.

	Column A	Column B
11.	The distance from the origin to point A	The distance from the origin to point B

	Column A	Column B
12.	$(x^3)^5(x^4)^5$	$(x^7)^5$

a and b are integers. $1 < a < b < 10$.

	Column A	Column B
13.	The number of multiples of a that are greater than 20 but less than 80	The number of multiples of b that are greater than 20 but less than 80

The mean of p, q, and r is 20.

	Column A	Column B
14.	The mean of p, q, r, and 40	30

	Column A	Column B
15.	The number of integers between 0 and 50 that are multiples of both 3 and 5	4

$X = \{3, 4, 5\}$
$Y = \{4, 5, 6\}$

	Column A	Column B
16.	The number of distinct products that can be formed by multiplying one element of X by one element of Y	The number of distinct sums that can be formed by adding one element of X and one element of Y

Directions (17–44): You are given five answer choices. Select the best choice.

17. Which of the following is equivalent to $b \cdot b \cdot b$?

A. $3b$
B. $b + 3$
C. b^3
D. $3b$
E. $3b^3$

18. The length of a rectangle is four inches more than its width. If the perimeter is 20 inches, what is the area of the rectangle, in square inches?

A. 20
B. 96
C. 64
D. 21
E. 32

19. A game booth at the carnival gave stuffed bears as prizes. The bears were identical except for color. Eight bears were brown, six were white, and four were black. A bear is selected at random for each winner. What is the probability that a winner will receive a black bear?

A. $\frac{1}{4}$
B. $\frac{2}{9}$
C. $\frac{2}{7}$
D. $\frac{1}{2}$
E. $\frac{2}{3}$

20. $5.4 \times 10^{-3} =$

A. 0.0054
B. 0.054
C. 0.54
D. 540
E. 5400

21. For all values of t for which it is defined, the expression $\frac{t^2+7t+10}{t^2-4}$ can be simplified to

A. $\frac{7t+10}{-4}$

B. $\frac{t+5}{t-2}$

C. $\frac{t+5}{t+2}$

D. $\frac{-5}{2}$

E. $\frac{t+3}{t}$

22. A right triangle has legs 15 cm and 20 cm long. Find the length of the hypotenuse.

A. 25 cm
B. 11.25 cm
C. 33 cm
D. 35 cm
E. 18 cm

23. What is the area of the circle defined by the equation $(x-4)^2+(y+9)^2=1$?

A. π
B. 2π
C. 3π
D. 4π
E. 9π

24. How many solutions are there to the equation $4x^2-36=0$?

A. 0
B. 1
C. 2
D. 3
E. 4

25. If $x\,|y - 3| < 0$, which of the following must be true?

A. $x < 0$
B. $y < 0$
C. $y < 3$
D. $y < -3$
E. $xy < 3x$

26. In a sample of 2,000 computer chips, 0.2% were found to be defective. What is the ratio of defective to nondefective chips?

A. 400 : 1,600
B. 40 : 1,960
C. 4 : 1,996
D. 4 : 2,000
E. 40 : 2,000

27. Which of the following is divisible by 9?

A. 6,541
B. 6,542
C. 6,543
D. 6,544
E. 6,545

28. If a particle travels 2.4×10^7cm/sec., how long will it take to travel 7.2×10^9cm, in seconds?

A. 3.0×10^{-2}
B. 3.0×10^2
C. 3.0×10^7
D. 3.0×10^9
E. 4.8×10^{63}

29. $\triangle XYZ$ is isosceles with $\overline{XY} \cong \overline{YZ}$. If $m\angle Y = 36°$, what is the measure of $\angle X$?

A. 36°
B. 54°
C. 60°
D. 72°
E. 144°

30. If $5t = 3v - 9$, which of the following is an expression for v in terms of t?

A. $v = 5t + 12$

B. $v = \frac{5}{3}t + 9$

C. $v = \frac{5t - 9}{3}$

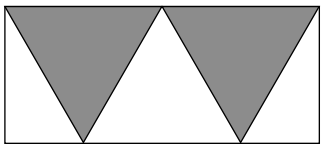
D. $v = \frac{5t + 9}{3}$

E. $v = \frac{3t - 9}{5}$

31. If 70% of the senior class had part-time jobs and there are 480 seniors, how many seniors did not have jobs?

A. 144
B. 160
C. 240
D. 288
E. 336

32. Find the area of the shaded region, if the rectangle is 24cm long and 8cm high.



A. 192
B. 96
C. 64
D. 48
E. 24

33. What is the length of the diagonal of a square whose area is 169 square inches?

A. $169\sqrt{2}$

B. $169\sqrt{3}$

C. $13\sqrt{2}$

D. $13\sqrt{3}$

E. $\frac{43\sqrt{2}}{2}$

34. If n is divided by 5, the remainder is 1. What is the remainder when $7n$ is divided by 5?

A. 0
B. 1
C. 2
D. 3
E. 4

35. Four children received a gift of candy, which they shared equally. The oldest child then gave half of his share to his youngest sister. Another brother kept three-fourths of his share and gave the rest to the youngest sister. What fraction of the candy did the youngest sister receive?

A. $\frac{1}{16}$
B. $\frac{3}{16}$
C. $\frac{1}{2}$
D. $\frac{5}{16}$
E. $\frac{7}{16}$

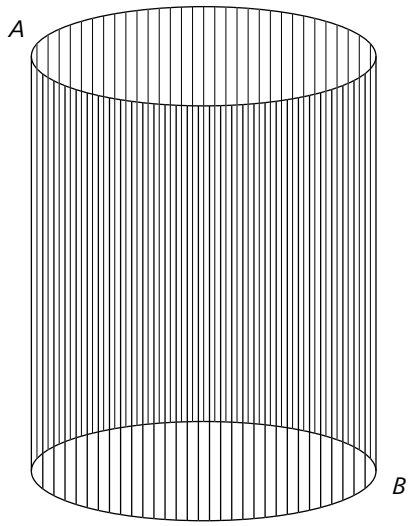
36. A shoe store routinely sells shoes for 50% more than its cost. At the end of each season, it clears out the remaining stock by selling it at 10% below cost. If a pair of shoes regularly sold for $75, what would you pay for them at the end-of-season sale?

A. $67.50
B. $37.50
C. $45.00
D. $101.25
E. $30.00

37. If the average (mean) of x and 10 is equal to the average (mean) of x, 3, 14, and 16, find the value of x.

A. 10
B. 11
C. 12
D. 13
E. 14

38. The hollow cylinder shown has a radius of 3 and a height of 8.



What is the straight-line distance from point A on the upper rim to point B on the lower rim?

A. $\sqrt{73}$
B. 11
C. 48π
D. 10
E. 20.5

Speed (mph)	Reaction Distance	Braking Distance
20	22	21
30	33	47
40	44	82
50	55	128
60	66	185

39. The previous table shows the distance required to stop a car at different speeds. The reaction distance is the distance the car travels in the time it takes the driver to realize that a stop is necessary and to apply the brakes. The braking distance is the additional distance the car will travel between the time the brake is applied and the time the car reaches a complete stop. Stopping distance is the total of reaction distance and braking distance. How much longer is the stopping distance for a car traveling at 60 mph than for one traveling at 40 mph?

A. 22
B. 55
C. 103
D. 125
E. 141

Building	Steps	Total Seconds
CN Tower, Toronto, Canada	1,776	687
Taipei 101, Taiwan	2,046	653
Sears Tower, Chicago, Illinois	2,109	822
Empire State Building, New York, New York	1,576	625
Hancock Tower, Chicago, Illinois	1,632	637
Boston Place, Boston, Massachusetts	697	272

40. Many tall buildings sponsor annual races in which participants run up the stairs to the building's top floor or observation deck. The table above lists the number of steps climbed and the first place finisher's time in seconds for some of these races. Based on the information in the table, which race's winner ran fastest?

A. Sears Tower
B. Taipei 101
C. Empire State Building
D. Hancock Tower
E. Boston Place

41. In rectangle $QRST$, point P is the midpoint of side RS. If the area of quadrilateral $QRPT$ is 30, what is the area of rectangle $QRST$?

A. 40
B. 60
C. 80
D. 100
E. 120

42. The difference between the measure of an interior angle of a regular hexagon and the measure of an external angles of a regular pentagon is

A. 12°
B. 36°
C. 48°
D. 60°
E. 90°

43. If $290 \leq 45 - 7w < 990$, all of the following could be true except

A. $w > -135$
B. $w < -35$
C. $w = -35$
D. $7w > -945$
E. $-245 \leq 7w$

44. Which of the following statements is true about the graph of $3x - 7y - 4 = 0$?

I. The x-intercept is $\left(\frac{4}{3}, 0\right)$

II. The y-intercept is $\left(0, \frac{4}{7}\right)$

III. The slope is 3

A. I only
B. II only
C. III only
D. I and II
E. I and III

Directions (45–50): Give your answer as a number.

45. Let $x \otimes y$ be defined as the product of the integers from x to y. For example, $3 \otimes 7 = 3 \times 4 \times 5 \times 6 \times 7$. What is the value of $\frac{2 \otimes 5}{6 \otimes 8}$?

46. If a and b are integers with $5 < a < 8$ and $6 < b < 9$, what is the difference between the largest and smallest possible values of ab?

47. If the sum of two numbers is 12 and their difference is 2, what is their product?

48. A rectangular solid has two faces that are squares with sides of 5. The other four faces of the solid are rectangles that are 5 by 8. Find the volume of the solid.

49. The average grade of a class of N students is 80 and the average of a class of P students is 70. When the two classes are combined, the average is 76. What is $\frac{P}{N}$?

50. On Monday, Jennifer placed 1 cent in her piggy bank. On Tuesday, she put 2 cents in. On Wednesday, she added 4 cents, and on Friday, she added 8 cents. If Jennifer continues this saving pattern, how much will be in her piggy bank after 10 days?

IF YOU FINISH BEFORE TIME IS CALLED, CHECK YOUR WORK ON THIS SECTION ONLY. DO NOT WORK ON ANY OTHER SECTION IN THE TEST.

STOP

Scoring the Diagnostic Test

Answer Key

Section 1: Verbal

1. A	**8.** C	**15.** A	**22.** B
2. A	**9.** A	**16.** C	**23.** C
3. B	**10.** A	**17.** D	**24.** C
4. C	**11.** B	**18.** C	**25.** E
5. B	**12.** D	**19.** C	**26.** C
6. E	**13.** E	**20.** B	**27.** C
7. A	**14.** B	**21.** C	**28.** B

Section 2: Quantitative

1. A	**14.** B	**27.** C	**40.** B
2. B	**15.** B	**28.** B	**41.** A
3. B	**16.** A	**29.** D	**42.** C
4. A	**17.** C	**30.** D	**43.** E
5. B	**18.** D	**31.** A	**44.** A
6. B	**19.** B	**32.** B	**45.** $\frac{5}{14}$
7. C	**20.** A	**33.** C	**46.** 14
8. B	**21.** B	**34.** C	**47.** 35
9. B	**22.** A	**35.** E	**48.** 200
10. B	**23.** A	**36.** C	**49.** $\frac{2}{3}$
11. C	**24.** C	**37.** D	**50.** $10.23
12. C	**25.** A	**38.** D	
13. A	**26.** C	**39.** D	

Answer Explanations

Section 1: Verbal

1. **A** *To depose* means to remove a czar, so the right answer must fit this sequence of removal or ending a rule. In Choice A, to checkmate a chess player is to position the opponent's king so that it cannot escape, thus ending the chess game. In choices B, C, D, and E, the words do not share the same relationship. *(See Chapter VI.)*

2. **A** A tactless person lacks sensitivity just as, in Choice A, a penurious person lacks generosity. In Choice B, an imperturbable person is not easily excited but does not lack assurance. In Choice C, an aggrieved person may lack composure but primarily lacks joy. In Choice D, *craven* and *cowardice* are similar in meaning, not reflecting opposite traits as would occur in this type of analogy. In Choice E, a bellicose person is inclined to fight; he may or may not have fear. *(See Chapter VI.)*

3. **B** Liberality, in this case meaning generosity, is characteristic of altruism just as independence is characteristic of autonomy, making Choice B the correct answer. In choices A and C, the key words fit into the category "without" or "lack of," not "characteristic of." There is no relationship or logical bridge between belief and temerity in Choice D. In Choice E, privation or lack of comforts may, but does not have to, include suffering. *(See Chapter VI.)*

4. **C** Nostalgia is a positive feeling about the past just as anticipation is a positive feeling about the future, so Choice C is the best answer choice because it shows a similar relationship between the word pairs. In choices A and B, there is no clear relationship. In choices D and E, the words are antonyms. *(See Chapter VI.)*

5. **B** A sycophant lacks sincerity just as a deceiver lacks truth. In choices C, D, and E, the relationship is "with" not "without," which rules out these choices (a coward has fear, a friend has loyalty, and a hero has courage). In Choice A, a thief may or may not be clever. *(See Chapter VI.)*

6. **E** An ascetic denies pleasure just as a hermit shuns society, making Choice E the best answer. None of the other choices fits the category to be without or to lack; indeed, the relationship is quite the opposite (a politician seeks votes, and a scientist seeks the truth). *(See Chapter VI.)*

7. **A** To square differences means to make straight or settle small disputes or differences. In Choice A, to arbitrate (or settle) a conflict means exactly the same thing. In Choice B, to cast a fracture is the first step to fix it, but it's not close enough. In Choice C, to antagonize or to make an enemy or antagonist of amities or friendships does not fit. In Choice D, to compromise negotiations implies giving up something in the settlement. In Choice E, to forgive means to pardon or absolve, and the second word, *troubles,* does not fit as well as Choice A. *(See Chapter VI.)*

8. **C** In this analogy, *travail* is a noun meaning "tribulation" or "anguish." When you're creating a bridge sentence, you could say "A travail will cause one to cry." Choice C shares a similar relationship between words: "A malady will cause one to ail," making it the best choice. The other choices do not match the relationship. *(See Chapter VI.)*

9. **A** The key words in context in this sentence are *not many people understand* and *gradual,* which fit best with the words *arcane* and *incrementally* in Choice A. The other choices do not make sense in the sentence. *(See Chapter VII.)*

10. A Choice A is the best answer because *tendency* means "habit," which fits in the sentence. The second word, *parsimonious,* cinches it because it fits well with the key phrase that acts as a clue: "saves dollar by dollar," meaning not spending much or being parsimonious. *(See Chapter VII.)*

11. B In this sentence completion, Choice B is the best answer because *laborious* matches the key word in the sentence "hardest," and *obtuse* means "difficult to understand," which also makes sense in this sentence. The other answer choices do not make sense. *(See Chapter VII.)*

12. D Choice D is correct because the clue in the sentence is the word *exaggerated,* which makes the answer *hyberbolic* correct. The other answer choices are meant to be confusing since they all contain the prefix *hyper-*. *(See Chapter VII.)*

13. E Choice E is correct because the clue in the sentence is the phrase "king or queen is usually limited by a constitution and a legislature," which makes sense with the second word in the answer choice, *hierarchy.* The remaining answer choices are either *monarchy* or *oligarchy* and can be ruled out. When you check the first word, *anarchy,* it makes sense. *(See Chapter VII.)*

14. B The key word in the sentence is *iridescent,* making the first word in Choice B, *sparkling,* fit best. The next step is to check the second word, *flay,* which means, in this context, "to criticize." Before you check off Choice B as the correct answer, it's important to check the other answers. None fits as well as B. *(See Chapter VII.)*

15. A Choice A works best because the words *quixotic* and *romance* fit best in the context of this sentence. The clue in the sentence is "unlikely." The other answer choices do not work as well. *(See Chapter VII.)*

16. C In Choice C, the words *defenseless* and *strafing* fit best because *defenseless* means "without protection" and *strafing* means "to attack with airplanes with machine gunfire." In the sentence, the clues that make Choice C the best answer are "bombs blowing up" by machine gunfire. The other answer choices do not make sense. *(See Chapter VII.)*

17. D *Myopia* means "nearsightedness." The antonym is clearly answer Choice D: *farsightedness.* Here is a case where it pays to have a strong vocabulary. The other answer choices are not the opposite in meaning to the uppercase word. Choices B and E have the same suffix, but they don't fit as antonyms. *(See Chapter VII.)*

18. C *Exoteric* means "popular." The antonym of *popular* is not A *(wild),* B *(exotic),* D *(urgent),* or E *(perfidious).* The only clear antonym is Choice C, *esoteric,* meaning "understood by or meant only by the select few who have knowledge of it." *(See Chapter V.)*

19. C Allopathy is the method of treating disease by use of agents that produce effects different from the disease. Clearly, Choice C, *homeopathy,* works best. Choice A has the same suffix, but that's just to confuse you. And choices D and E are not the opposite in meaning. *(See Chapter V.)*

20. B This is a good example of the test writers using a secondary meaning of the word. Once you look at the answer choices, you see that, in this context, *list* is a verb, not a noun. *To list* means "to lean," so the antonym is Choice B. The other choices, D and E, are meant to confuse you, but they aren't the opposite in meaning. *(See Chapter V.)*

21. C *Pinchbeck* is not an everyday word, but you might know that it means "counterfeit." In that case, you'll know that Choice C is correct. If not, you can look at the answer choices and rule out the words that do not have antonyms. For example, choices A and E do not have opposite meanings. So, if you

don't know the meaning of *pinchbeck,* you're left only with choices B, C, and D (which happens to be a synonym), improving your odds. *(See Chapter V.)*

22. **B** The word *chutzpah* means "audacity," "gall," or "nerve," which is the antonym of Choice B, *diffidence,* which means "shyness" or "timidity." The other answer choices do not fit as antonyms. If you don't know what *chutzpah* means, you can look at the answer choices and ask yourself if you can rule out any ones that do not have antonyms. *(See Chapter V.)*

23. **C** *Recondite* means dealing with difficult or abstruse subject matter or something that is hard to understand. Choice C, *understandable,* is the opposite in meaning to this word. Choices A and D are closer to synonyms than antonyms. Choice B does not fit as an antonym, and it's meant to be confusing because it has the same suffix. And, clearly, Choice E doesn't work. *(See Chapter V.)*

24. **C** Choice C fits best as the primary purpose of the passage. Choice A is not correct because the passage is not about the proposal only. Choices B and E are too broad. Choice D is too specific. Thus, C is the best choice. *(See Chapter VIII.)*

25. **E** Choice E is the best answer. Choice A is too broad. Choice B is too specific and does not answer the question: "How do you know that the war did not end in appeasement?" Choices C and D do not make sense as answers. *(See Chapter VIII.)*

26. **C** Choice C is the best answer choice as the details in the narrative that suggest it was possible to fulfill the requirement that the monument express no political view of the war. Choice C is the only answer showing details on the monuments or specific names. *(See Chapter VIII.)*

27. **C** Based on the passage, religion plays a significant role in Tennyson's poetry from his upbringing and observation, making Choice C the correct answer. *(See Chapter VIII.)*

28. **B** Choice B is the correct answer because the passage is a biographical sketch of Tennyson and touches upon his religious influence, filial ties, and his university life as it relates to his work. The other answer choices are lacking. *(See Chapter VIII.)*

Section 2: Quantitative

1. **A** Since $\left(\frac{x}{y}\right)^2 > \frac{x}{y}$ and $\left(\frac{y}{x}\right)^2 < \frac{y}{x}, \frac{x}{y}$ must be greater than 1 and $\frac{y}{x}$ must be less than 1, so $x > y$. *(See Chapter X, Section D.)*

2. **B** Multiplying both sides by 100 gives $x = 207$. *(See Chapter X, Section E.)*

3. **B** The number 4.2953 rounded to the nearest thousandth is 4.295. The digit in the thousandths place is 5 and the digit in the hundreds place is 9. *(See Chapter X, Section F.)*

4. **A** If $3 < a < b < 4, 1 < 33\frac{1}{3}\%$ of $a < \frac{4}{3}$ and $\frac{3}{4} < 25\%$ of $b < 1. 25\%$ of $b < 1 < 33\frac{1}{3}\%$ of a. *(See Chapter X, Section G.)*

5. **B** $\frac{n}{5} = \frac{p}{3} \quad 3n = 5p \quad n = \frac{5p}{3} \quad n+1 = \frac{5p}{3}+1 = \frac{5p+3}{3} \quad \frac{n+1}{5} = \frac{5p+3}{3\cdot 5} = \frac{p+\frac{3}{5}}{3}$. *(See Chapter X, Section E.)*

6. **B** If 5 times the difference between a and b is 25, then the difference between a and b is 5, so 6 times the difference between a and b is 30. *(See Chapter XI, Section A.)*

7. **C** $\sqrt{n^2} = |n|$, which is just n, since $n \geq 0$ and $\left(\sqrt{n}\right)^2 = n$. *(See Chapter X, Section I.)*

8. **B** The three angles must total 180°, and since all three are equal, x must equal 60. *(See Chapter XII, Section B.)*

9. **B** The area of $\triangle PQR = \frac{1}{2}(2x)(x) = x^2$ and half the area of a circle of radius $x = \frac{1}{2}\pi \cdot x^2$. Since half of π is greater than one, $\frac{1}{2}\pi \cdot x^2 > x^2$. *(See Chapter XII, Sections B and F.)*

10. **B** The length of a side of the square can be determined to be 24 ÷ 4 or 6, but the longer side of the rectangle will be greater than 6. In order to have a rectangle that is not a square and, thus, has a longer side, there must be a shorter side that is less than 6 and a longer side that is greater than 6. *(See Chapter XII, Section C.)*

11. **C** The distance from the origin to point $A = \sqrt{(-x-0)^2 + (y-0)^2} = \sqrt{x^2 + y^2}$. The distance from the origin to point $B = \sqrt{(x-0)^2 + (-y-0)^2} = \sqrt{x^2 + y^2}$. *(See Chapter XII, Section H.)*

12. **C** $(x^3)^5(x^4)^5 = x^{15}x^{20} = x^{35}$ and $(x^7)^5 = x^{35}$. *(See Chapter X, Section H.)*

13. **A** Since you're given little information about a and b, trying various possibilities won't be efficient. Instead, consider that the larger the number, the farther apart its multiples will fall, and so the fewer multiples will fall in a fixed range. For example, multiples of 9 between 20 and 80 include 27, 36, 45, 54, 63, and 72—a total of six—but multiples of 8 number seven: 24, 32, 40, 48, 56, 64, and 72. *(See Chapter X, Section C.)*

14. **B** If the mean of p, q, and r is 20, the sum of p, q, and r is 60; therefore the sum of p, q, r, and 40 is 100 and the mean of p, q, r, and 40 is 100 ÷ 4 = 25. *(See Chapter XIII, Section A.)*

15. **B** Integers that are multiples of both 3 and 5 are multiples of 15, so they include 15, 30, and 45, a total of three. *(See Chapter X, Section C.)*

16. **A** Three elements in X and three elements in Y mean that there are nine products and nine sums, but they may not all be distinct. Products include 3×4, 3×5, 3×6, 4×4, 4×5, 4×6, 5×4, 5×5, and 5×6. Only 4×5 and 5×4 are duplicated; there are eight distinct products. Sums include 3 + 4, 3 + 5, 3 + 6, 4 + 4, 4 + 5, 4 + 6, 5 + 4, 5 +5, 5 + 6, giving only five distinct sums. *(See Chapter XIII, Section C.)*

17. **C** $b \cdot b \cdot b$ is the product obtained by using b as a factor three times, which would be written as b^3. *(See Chapter X, Section H.)*

18. **D** $L = 4 + W$ and $P = 2L + 2W = 2(4 + W) + 2W = 20$. Solving the equation $8 + 4W = 20$ gives $W = 3$ so $L = 7$ and the area is $L \cdot W = 21$ square inches. *(See Chapter XII, Section C.)*

19. **B** The probability that a winner will receive a black bear = the number of black bears divided by the total number of bears. P(black bear) = $\frac{4}{18} = \frac{2}{9}$. *(See Chapter XIII, Section C.)*

20. **A** Move the decimal point three places to the left. *(See Chapter X, Section F.)*

21. **B** $\frac{t^2 + 7t + 10}{t^2 - 4} = \frac{(t+5)\cancel{(t+2)}}{\cancel{(t+2)}(t-2)} = \frac{t+5}{t-2}$. *(See Chapter XI, Section D.)*

22. **A** Use the Pythagorean theorem: $c = \sqrt{a^2 + b^2} = \sqrt{15^2 + 20^2} = \sqrt{225 + 400} = \sqrt{625} = 25$. A quicker method is to recognize that these values are multiples of a Pythagorean triple. *(See Chapter XII, Section B.)*

23. A The equation describes a circle with center at (4,–9) and a radius of 1. Only the radius is important to the question. Area is $\pi r^2 = \pi$. *(See Chapter XII, Sections F and H.)*

24. C $4x^2 - 36 = 0 \rightarrow 4x^2 = 36 \rightarrow x^2 = 9 \rightarrow x = \pm 3$. *(See Chapter XI, Section D.)*

25. A The absolute value of any expression behaves as a positive, so the fact that $x\,|y - 3| < 0$ tells us that $x < 0$. We cannot make a determination about y. *(See Chapter XI, Section A.)*

26. C If 0.2% of 2,000 computer chips are defective, there are $0.002 \times 2{,}000 = 4$ defective chips, and 1,996 non-defective chips. *(See Chapter X, Sections E and G.)*

27. C Add the digits to determine divisibility quickly: 6 + 5 + 4 + 1 = 16, 6 + 5 + 4 + 2 = 17, 6 + 5 + 4 + 3 = 18. Since 18 is divisible by 9, 6,543 is divisible by 9. *(See Chapter X, Section C.)*

28. B Distance divided by rate equals time, so $\frac{7.2\times10^9}{2.4\times10^7} = \frac{7.2}{2.4}\times\frac{10^9}{10^7} = 3\times10^2 = 300$ seconds. *(See Chapter X, Section F, and Chapter XIII, Section D.)*

29. D If $\triangle XYZ$ is isosceles with $\overline{XY} \cong \overline{YZ}$, $\angle Y$ is the vertex angle. If $m\angle Y = 36°$, then each of the congruent base angles measures $\frac{180-36}{2} = \frac{144}{2} = 72°$. *(See Chapter XII, Section B.)*

30. D $5t = 3v - 9 \Rightarrow 5t + 9 = 3v \Rightarrow \frac{5t+9}{3} = v$. *(See Chapter XI, Section A.)*

31. A 70% of 480 = $\frac{7}{10}\times480 = 7\times48 = 336$ and 480 – 336 = 144. Alternately, if 70% had jobs, 30% did not, so $\frac{3}{10}\times480 = 3\times48 = 144$. *(See Chapter X, Section G.)*

32. B The area of the rectangle is $24 \times 8 = 192$ square centimeters, but each of the shaded triangles has a height of 8 and a base of half of 24. The combined area of the two triangles is $2\times\frac{1}{2}\times\left(\frac{1}{2}\times24\right)\times8 = \left(\frac{1}{2}\times24\right)\times8$, which is 96cm^2, or half the area of the rectangle. *(See Chapter XII, Section E.)*

33. C If the area of the square is 169 square inches, each side is 13 inches, so the diagonal is $13\sqrt{2}$. *(See Chapter XII, Section D.)*

34. C N is one more than a multiple of five, a number of the form $5p + 1$, so multiplying N by 7 will produce a number of the form $35p + 7$. Dividing $35p + 7$ by 5 produces $\frac{35p+7}{5} = 7p + 1$ with a remainder of 2. *(See Chapter X, Section C.)*

35. E If the four children shared the candy equally, each began with $\frac{1}{4}$ of the candy. The oldest brother gave $\frac{1}{2}\cdot\frac{1}{4} = \frac{1}{8}$ of the candy to the youngest sister. The other brother gave $\frac{1}{4}\cdot\frac{1}{4} = \frac{1}{16}$ of the candy to her. So the youngest sister had $\frac{1}{4}+\frac{1}{8}+\frac{1}{16} = \frac{4}{16}+\frac{2}{16}+\frac{1}{16} = \frac{7}{16}$ of the candy. *(See Chapter X, Section D.)*

36. C The regular price of \$75 is 150% of cost, so cost is \$75 ÷ 1.50 = \$50. At the end of the season, it will sell for 90% of cost, or 0.90×50 = \$45. *(See Chapter X, Section G.)*

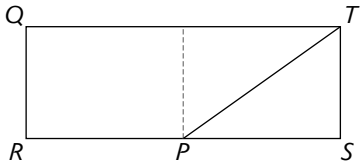
37. D The mean of x and 10 is equal to $\frac{x+10}{2}$ and the mean of x, 3, 14, and 16 is $\frac{x+3+14+16}{4}=\frac{x+33}{4}$. If $\frac{x+10}{2}=\frac{x+33}{4}$, then $\frac{2(x+10)}{4}=\frac{x+33}{4}$ and $2(x+10)=x+33$. Solving, $2x+20=x+33 \rightarrow x=13$. *(See Chapter XIII, Section A.)*

38. D A radius of 3 means a diameter of 6, and the diameter and height form the legs of a right triangle, whose hypotenuse, the straight line distance from A to B, can be found by the Pythagorean theorem. $c=\sqrt{a^2+b^2}=\sqrt{6^2+8^2}=\sqrt{100}=10$. *(See Chapter XII, Sections B and F.)*

39. D The stopping distance for a car traveling at 60 mph is 66 + 185 = 251 feet. The stopping distance for a car traveling at 40 mph is 44 + 82 = 126 feet. The difference is 251 – 126 = 125 feet. *(See Chapter XIII, Section D.)*

40. B Actually calculating speeds would be time consuming. Using a rough estimation, most of the runners covered fewer than 3 steps per second, while the winner of the Taipei 101 climbed more than 3 steps per second. *(See Chapter XIII, Section D.)*

41. A Drawing the diagram will be helpful.



If a perpendicular were drawn to P, it would divide the rectangle in half, so the area of quadrilateral $QRPT$ is three-fourths of the area of the rectangle. *(See Chapter XII, Section C, and Chapter X, Section D.)*

42. C The measure of an interior angle of a regular hexagon is $\frac{180(6-2)}{6}=120°$. The measure of an exterior angle of a regular pentagon is $\frac{360}{5}=72°$. The difference is 120° – 72° = 48°. *(See Chapter XII, Section D.)*

43. E $290 \le 45-7w < 990 \rightarrow 245 \le -7w < 945 \rightarrow -35 \ge w > -135$. *(See Chapter XI, Section A.)*

44. A When $y = 0$, $3x-7(0)-4=0 \Rightarrow 3x=4 \Rightarrow x=\frac{4}{3}$, so I is true. When $x = 0$, however, $3(0)-7y-4=0 \Rightarrow -7y=4 \Rightarrow y=-\frac{4}{7}$, so II is not true. Putting the equation in slope-intercept form, $-7y=-3x+4 \Rightarrow y=\frac{3}{7}x-\frac{4}{7}$, shows that III is not true. *(See Chapter XII, Section H.)*

45. $\frac{5}{14}$ Applying the definition, $\frac{2\otimes 5}{6\otimes 8}=\frac{2\cdot 3\cdot 4\cdot 5}{6\cdot 7\cdot 8}=\frac{5}{14}$. *(See Chapter XIII, Section B.)*

46. 14 a could be 6 or 7 and b could be 7 or 8, so the possible products are 42, 48, 49, and 56. The difference between the largest and the smallest is 56 – 42 = 14. *(See Chapter XIII, Section C.)*

47. 35 If x and y represent the two numbers, $x + y = 12$ and $x – y = 2$. Adding the equations, $2x = 14$ and $x = 7$. $y = 12 – 7 = 5$. So the product $xy = 35$. *(See Chapter XI, Section B.)*

48. 200 The volume of a rectangular solid is length × width × height. Taking the square face as the base and 8 as the height, $V = 5 \times 5 \times 8 = 200$ cubic units. *(See Chapter XII, Section G.)*

49. $\frac{2}{3}$ If the average of N grades is 80, then the total of all the grades in that group is $80N$. The total of the grades in the class of P students is $70P$. When the classes are combined, $\frac{80N + 70P}{N + P} = 76$. While one equation is not sufficient to solve for N or P, it is enough to express the relationship between N and P. Cross-multiply and simplify, and work toward an equation with $\frac{P}{N}$ on one side. $80N + 70P = 76(N + P) \rightarrow 80N + 70P = 76N + 76P \rightarrow 4N = 6P$. Then $\frac{4N}{6} = \frac{6P}{6} \Rightarrow \frac{2N}{3} = P \Rightarrow \frac{2\cancel{N}}{3\cancel{N}} = \frac{P}{N}$. *(See Chapter XIII, Section A.)*

50. $10.23 It's possible to calculate each day's addition to savings and then add, but it may be faster to look for a pattern in the cumulative sum. On day 1, she deposits 1¢, for a total of 1¢. On day 2, she deposits 2¢ for a total of 3¢. On day 3, she deposits 4¢ for a total of 7¢. Each day's total is 1 cent less than the next day's deposit. Calculate the deposit for the 11th day and subtract one to find the ten-day total. On the 11th day, she would deposit 2^{10} cents, or $10.24, so the ten-day total is $10.23. *(See Chapter XIII, Section F.)*