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Mathematics

HiSET® Exam Free Practice Test FPT2

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Directions

This is a test of your skills in applying mathematical concepts and solving mathematical problems. Read each question carefully and decide which of the five alternatives best answers the question. Then mark your choice on your answer sheet.

There are relatively easy problems scattered throughout the test. Thus, do not waste time on problems that are too difficult; go on, and return to them if you have time.

Work as quickly as you can without becoming careless. Try to answer every question even if you have to guess.

Mark all your answers on the answer sheet. Give only one answer to each question.

If you decide to change one of your answers, be sure to erase the first mark completely.

Be sure that the number of the question you are answering matches the number of the row of answer choices you are marking on your answer sheet.

1. A picture-framing shop has the sign shown below in the window.

Frame Sale!
Half Off 17-inch-by-24-inch Frames

A customer has a 4-inch-by-6-inch picture. If the customer wants to enlarge the photograph so that it will come as close as possible to fitting a sale frame, how many times larger should the photo be?

- A.   2
- B.   3
- C.   4
- D.   5
- E.   13

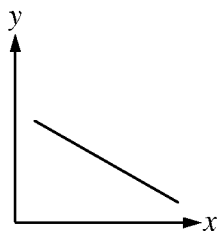2. Consider the advertisement below.

SALE! PAPER SALE!
$25 PER BOX
(5,000 sheets per box)

Which of the following expressions represents the cost, in dollars, of 20,000 sheets of paper?
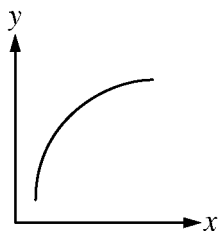
- A. $\dfrac{20,000}{5,000} \times 25$

- B. $20,000 \times 25$

- C. $\dfrac{20,000}{5,000}$

- D. $\dfrac{20,000}{25}$

- E. $25 \times \dfrac{5,000}{20,000}$

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3. Which of the following sets of data would be best represented by a circle graph?

A. The percent of recent United States immigrants from different continents
B. The life expectancies of various animals
C. College tuition increases over the last 5 years for a state university
D. The percents of people living in urban and rural regions in each of the last 6 years
E. The number of kilowatt hours of electricity used by a household each month over a 1-year period

4. If 6 bottles of Perfect Water weigh a total of 4 kilograms (kg), what is the weight of 9 bottles?

A. 5 kg
B. 6 kg
C. 7 kg
D. 7.5 kg
E. 8 kg

5. A tourist's cab fare was $12.89. If she would like to give the driver a tip of 15 percent, approximately how much money should she give as a tip?

A. $1.00
B. $1.50
C. $2.00
D. $2.50
E. $3.00

6. The floor of a 15-foot-by-20-foot rectangular room is being covered with carpet tiles. Each carpet tile covers 6 square feet of floor. Which of the following expressions represents the number of carpet tiles needed to cover the entire floor?

A. $15 \times 20 \times 6$

B. $\dfrac{20 \times 6}{15}$

C. $\dfrac{15 \times 20}{6}$

D. $\dfrac{6}{15 \times 20}$
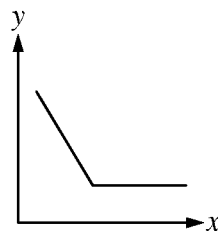
E. $\dfrac{15 \times 6}{20}$

7. Which of the following graphs represents the relationship between variables x and y if a decrease in x is always accompanied by an increase in y within the domain shown?

I   II   III

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

_____

8. A company charges $8 an hour for lawn mowing. What would the company charge for a lawn that takes 1 hour and 45 minutes to mow?

A. $16
B. $14
C. $12
D. $10
E. $8

9. In a certain apartment building, apartments can come with 2, 3, or 4 bedrooms; they can have 1 or 2 bathrooms; and they can be located on the lower, middle, or upper level. How many different types of apartments are possible if any number of bedrooms, bathrooms, and locations can be combined?

A. 6
B. 8
C. 12
D. 18
E. 20

10. A restaurant owner is planning to have a courtyard area sodded. The sod comes in rolls that are 3 feet long by 1 foot wide. If the courtyard measures 60 feet by 50 feet, which of the following expressions represents the number of rolls of sod needed?

A. 60×50

B. $60 \times 50 \div 3$

C. $60 \times 50 \times 3$

D. $(60 + 50) \div 3$

E. $(60 + 50) \times 3$

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11. Consider the equation $6x + 7 = 3x - 5$. Which of the following possible first steps would prevent having to deal with fractions when solving the equation?

> I. Combining the $6x$ and $3x$ terms
>
> II. Combining the 7 and 5
>
> III. Dividing both sides of the equation by 6

A. I only

B. II only

C. III only

D. I or II only

E. I or II or III

12. A book states that the longest river in a country is about 3,700 kilometers long. The actual length of the river is most likely between

A. 3,600 km and 3,700 km.

B. 3,650 km and 3,700 km.

C. 3,650 km and 3,750 km.

D. 3,700 km and 3,750 km.

E. 3,700 km and 3,800 km.

13. Which of the following correctly expresses x decimeters, y centimeters, and z millimeters in terms of meters?

A. $\dfrac{x}{10} + \dfrac{y}{100} + \dfrac{z}{1{,}000}$

B. $\dfrac{x}{1{,}000} + \dfrac{y}{100} + \dfrac{z}{10}$

C. $10x + 100y + 1{,}000z$

D. $1{,}000x + 100y + 10z$

E. $\dfrac{x}{10} + \dfrac{y}{10} + z$

14. A group of hospital workers belonging to a union each earn the same hourly wage. The union dues are 2 percent of each paycheck regardless of whether the employee works full-time, half-time, or quarter-time. Does this mean that the amount of money deducted will be the same for all the employees?

A. Yes.

B. No, the quarter-time employees will have the greatest amount deducted from their paychecks.

C. No, the half-time employees will have the greatest amount deducted from their paychecks.

D. No, the quarter-time and half-time employees will have the greatest amount deducted from their paychecks.

E. No, the full-time employees will have the greatest amount deducted from their paychecks.

15. An auditorium has a seating capacity of 1,500. For an upcoming community theater play, tickets cost $4 for adults and $2 for children. At last year's play, twice as many children attended as did adults. If the attendance at this year's play has the same ratio, which of the following expressions represents the best estimate of the total amount of money from ticket sales when the auditorium is filled to capacity?

    A. $1,500 \times \$4$

    B. $1,500 \times \$2$

    C. $(750 \times \$4) + (750 \times \$2)$

    D. $(1,000 \times \$4) + (500 \times \$2)$

    E. $(500 \times \$4) + (1,000 \times \$2)$

16. If a bathroom door is 2 units tall, 1 unit most likely represents a

    A. meter.
    B. kilometer.
    C. centimeter.
    D. decimeter.
    E. millimeter.

Questions 17 and 18 refer to the information below.

The table below shows the average monthly incomes of people with different levels of education.

Level of Education	Average Monthly Income
High-school diploma	$1,400
Vocational degree	$1,750
2-year college degree	$2,000
4-year college degree	$2,700

17. After completing her four-year college degree, Lynn has a $20,000 loan. She earns the average monthly income for her level of education. If her living expenses are $1,700 per month, in how many months could Lynn pay off her loan?

    A. 25
    B. 20
    C. 15
    D. 12
    E. 8

18. On average, approximately how much more money will a person who has a two-year college degree earn in an entire year compared with a person who has a vocational degree?

    A. $250
    B. $2,400
    C. $3,000
    D. $3,600
    E. $4,800

19. The city water department reported that the average amount of water used per household each month in the last year was 1,000 cubic feet. Employees from the department randomly sampled 50 homes in the community and reviewed the water bills for a recent month. Which of the following would most likely be true of the water consumption of the 50 households?

   A. Each household will have used exactly 1,000 cubic feet.
   B. Each household will have used at least 1,000 cubic feet.
   C. Each household will have used at most 1,000 cubic feet.
   D. Twenty-five of the households will have used more than 1,000 cubic feet, and 25 of the households will have used less than 1,000 cubic feet.
   E. Twenty-five of the households will have used exactly 1,000 cubic feet, and 25 of the households will have used either more or less than 1,000 cubic feet.

20. A family has decided to plant a rectangular garden along the entire length of a 25-foot-long fence in the backyard. If the family wants to have a plot of 125 square feet within which to plant, how many feet wide should the garden be?

   A.   5
   B.   25
   C.   50
   D.   75
   E.   100

21. The efficiency of converting from one form of power to another form is defined by the formula below.

$$\text{Efficiency} = \frac{\text{Output power}}{\text{Input power}}$$

If the efficiency remains constant, which of the following is true?

   A. When input power remains constant, output power increases.
   B. When input power increases, output power decreases.
   C. When input power decreases, output power increases.
   D. When input power decreases, output power remains constant.
   E. When input power increases, output power increases.

22. At a track meet, the officials measure the long jumps to the nearest $\frac{1}{100}$ of a meter. If a participant's jump is recorded as 6.50 meters, the actual jump is probably between

   A. 6.45 and 6.50 meters.
   B. 6.495 and 6.50 meters.
   C. 6.495 and 6.505 meters.
   D. 6.50 and 6.505 meters.
   E. 6.50 and 6.55 meters.

23. Consider the table below.

$$1{,}000 \text{ bytes} \approx 1 \text{ KB}$$
$$1{,}000 \text{ KB} \approx 1 \text{ MB}$$
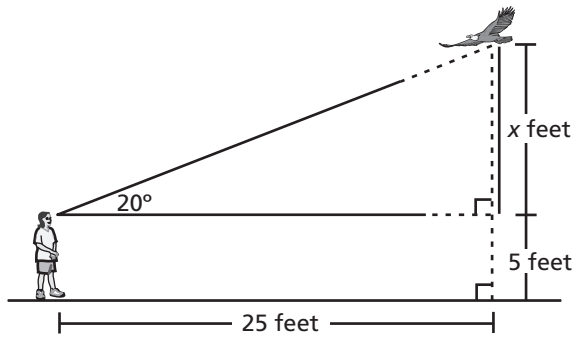$$1{,}000 \text{ MB} \approx 1 \text{ GB}$$

Using the approximations in the table, which of the following expressions represents the number of bytes in 2.4 GB?

A. 2.4×10^{-9}

B. 2.4×10^{3}

C. 2.4×10^{6}

D. 2.4×10^{9}

E. 2.4×10^{27}

24. A new yo-yo factory is operating at 80 percent of capacity and produces 4,000 yo-yos daily. When the factory reaches 100 percent of capacity, how many yo-yos should be produced each day?

A. 800
B. 3,200
C. 4,800
D. 5,000
E. 7,200

25. An artist knows that it costs her an average of $40 per painting to have frames built at a frame shop. She is taking 30 framed paintings to an art fair. If she sells each painting for $100, how many paintings does she need to sell to pay for the frames?

A. 3
B. 12
C. 30
D. 40
E. 75

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26. Naomi is looking at a flying eagle, as shown in the diagram below.

Which expression represents the eagle's height, in feet, above the ground?

A. $\dfrac{25}{\tan 20} - 5$

B. $\dfrac{25}{\tan 20} + 5$

C. $20\tan(25) + 5$

D. $20\tan(25) - 5$

E. $25\tan(20) + 5$

27. Find the cubic equation that has -1 and $2i$ as roots.

A. $y = x^3 - x^2 + 4x - 4$
B. $y = x^3 + x^2 - 4x - 4$
C. $y = x^3 + x^2 + 4x + 1$
D. $y = x^3 + x^2 + 4x + 4$
E. $y = x^3 - x^2 + 4x - 1$

28. Suppose the functions $f(x)$ and $g(x)$ are inverse functions. About what line is the graph of $g(x)$ a reflection of the graph of $f(x)$?

A. The x-axis
B. The y-axis
C. The line $y = 0$
D. The line $y = x$
E. The line $y = -x$

29. Simplify the following expression completely.

$$(\sqrt{3} + 2\sqrt{5})^2$$

A. $2\sqrt{3} + 4\sqrt{5}$
B. 23
C. $3 + 8\sqrt{15}$
D. $23 + 4\sqrt{15}$
E. $25\sqrt{15}$

30. What is the solution to

$-5+\sqrt[4]{7x-3}=-2$?

 A. $x=3$
 B. $x=4$
 C. $x=6$
 D. $x=9$
 E. $x=12$

31. What equation represents the relationship that s is directly related to r and inversely related to t?

 A. $s=rt$

 B. $s=\dfrac{t}{r}$

 C. $s=\dfrac{r}{t}$

 D. $s=\dfrac{1}{rt}$

 E. $s=r+\dfrac{1}{t}$

32. Factor the following expression: $2x^3-10x^2-12x$.

 A. $2x(x-6)(x+1)$
 B. $2x(x+6)(x-1)$
 C. $2x(x-3)(x-2)$
 D. $2x(x+3)(x+2)$
 E. $2x(x+6)(x+1)$

STOP

Mathematics Practice Test
Answer Key

Question Number	Correct Answer	Question Difficulty	Question Type
1	C	Easy	Measurement/Geometry
2	A	Easy	Numbers and Operations on Numbers
3	A	Easy	Data Analysis/Probability/Statistics
4	B	Medium	Algebraic Concepts
5	C	Medium	Numbers and Operations on Numbers
6	C	Easy	Measurement/Geometry
7	A	Hard	Algebraic Concepts
8	B	Easy	Numbers and Operations on Numbers
9	D	Medium	Data Analysis/Probability/Statistics
10	B	Medium	Measurement/Geometry
11	D	Medium	Algebraic Concepts
12	C	Easy	Data Analysis/Probability/Statistics
13	A	Medium	Algebraic Concepts
14	E	Medium	Numbers and Operations on Numbers
15	E	Easy	Algebraic Concepts
16	A	Easy	Measurement/Geometry
17	B	Medium	Numbers and Operations on Numbers
18	C	Medium	Numbers and Operations on Numbers
19	D	Medium	Data Analysis/Probability/Statistics
20	A	Medium	Measurement/Geometry
21	E	Medium	Algebraic Concepts
22	C	Medium	Measurement/Geometry
23	D	Hard	Algebraic Concepts
24	D	Medium	Algebraic Concepts
25	B	Easy	Numbers and Operations on Numbers
26	E	Medium	Measurement/Geometry
27	D	Hard	Algebraic Concepts
28	D	Medium	Algebraic Concepts
29	D	Easy	Algebraic Concepts
30	E	Hard	Algebraic Concepts
31	C	Easy	Algebraic Concepts
32	A	Easy	Algebraic Concepts