

绝密★启用前

8-9 插班测试数学 (英文)

试题整理：新航道国际备考教研中心

(满分 100 分，考试时间 60mins)

姓名：_____

分数：_____

注意事项：

1. 答题时，考生务必在相应位置写好自己的姓名；
2. 答题时，必须在答题卷上写出相应的计算步骤或主要步骤。

Record your answer on the answer sheet provided.

1. Simplify: $(2x^4y^5)^3$

- A. $6x^{12}y^{15}$ B. $2x^{12}y^{15}$ C. $8x^{64}y^{125}$ D. $8x^{12}y^{15}$ E. $8x^7y^8$

2. Rewrite 4^{-3} using positive exponents only and evaluate the result.

- A. $\frac{1}{4^3} = \frac{1}{64}$ B. $-3 \times 4^1 = -12$ C. $4^3 = 64$ D. $-4^3 = -64$ E. $4^3 = 12$

3. Evaluate: $\left(\frac{4}{49}\right)^{\frac{1}{2}}$

- A. $\frac{7}{2}$ B. $-\frac{7}{2}$ C. $\frac{2}{7}$ D. $-\frac{2}{7}$ E. $-\frac{2}{49}$

4. Simplify and rewrite using only positive exponents: $\left(\frac{4x^2}{(2y)^3}\right)^{-2}$

- A. $\frac{x^4}{4y^6}$ B. $\frac{4y^6}{x^4}$ C. $\frac{-4y^6}{x^4}$ D. $\frac{1}{y^6}$ E. y^6

5. Write an algebraic equation for the following "After 7 is added to a number the sum is divided by 4. The result is 12."

- A. $\frac{7n}{4} = 12$ B. $\frac{n}{7} + 4 = 12$ C. $n + \frac{7}{4} = 12$ D. $\frac{n}{4} + 7 = 12$ E. $\frac{n+7}{4} = 12$

6. Solve for x given $4(3x-7)=-7$

- A. $\frac{7}{6}$ B. 0 C. $-\frac{35}{12}$ D. $\frac{7}{4}$ E. $\frac{35}{12}$

7. Solve for x given $4-2(3x-4)=1-(5x+4)$.

- A. -9 B. -1 C. 15 D. 3 E. 7

8. What is the value of the expression $-3x^2+4x$ when $x=-5$?

- A. -55 B. -95 C. 50 D. 95 E. 55

9. Evaluate $-2a^3b-4a^4$ for $a=-3$ and $b=-2$

- A. 432 B. -432 C. -128 D. 144 E. -144

10. Solve: $3x-7 \geq -22$

- A. $x \leq 5$ B. $x \leq -5$ C. $x \leq -\frac{28}{3}$ D. $x \geq -5$ E. $x \geq 5$

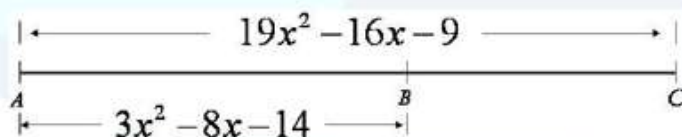
11. Solve: $\frac{15-2x}{3} < 7$

- A. $x > 18$ B. $x < 18$ C. $x < -3$ D. $x > -3$ E. $x < 3$

12. Simplify: $(4x^2-8xy+2y^2)-(9x^2-4xy-7y^2)$

- A. $-5x^2-4xy-5y^2$ B. $-5x^2-4xy+9y^2$ C. $-5x^2+12xy+4y^2$
 D. $-5x^2+4xy+9y^2$ E. $-5x^2-12xy+9y^2$

13. How long is BC?



- A. $22x^2-19x-23$ B. $-16x^2+8x-5$ C. $16x^2-8x-5$
 D. $16x^2-24x+5$ E. $16x^2-8x+5$

14. Simplify: $(-7a-19c)-(-12a+30c)-(-21a-11c)$

- A. $26a-38c$ B. $-26a-22c$ C. $-16a-60c$ D. $2a+22c$ E. $26a+38c$

15. When $6x^3y-10x^2y^2$ is completely factored, one of the factors will be _____.

- A. $3x-5y$ B. $2xy^2$ C. $2xy$ D. $3x-5y^2$ E. $3x-5$

16. Simplify: $(2x^4y^3) \times (6x^3y^2)$

- A. $12x^{12}y^6$ B. $12x^7y^5$ C. $12x^4y^3$ D. $8x^{12}y^6$ E. $8x^7y^5$

17. Simplify: $\frac{24x^6 - 30x^3 + 6x}{6x}$

- A. $4x^5 - 5x^2 + x$ B. $4x^6 - 5x^3 + 1$ C. $4x^5 - 5x^2 + 1$
 D. $4x^5 - 5x$ E. $18x^5 - 36x^2$

 18. When $(4x - 1)(2x + 7)$ is expanded and written in the form $Ax^2 + Bx + C$, what is the value of $A + B + C$?

- A. 31 B. 27 C. 12 D. -27 E. -31

19. Expand and simplify: $\left(\frac{x}{2} + 7\right)\left(\frac{x}{2} - 9\right)$

- A. $\frac{x^2}{4} - \frac{1}{2}x - 63$ B. $\frac{x^2}{4} + x - 63$ C. $\frac{x^2}{4} - x - 63$
 D. $x^2 - x - 63$ E. $\frac{x^2}{2} - x - 63$

20. Multiply: $(4x - 3)(3x^3 - 5x + 3)$

- A. $12x^4 - 9x^3 - 20x^2 - 27x - 9$ B. $12x^4 - 9x^3 - 20x^2 + 27x - 9$ C. $12x^4 + 9x^3 - 20x^2 + 27x - 9$
 D. $12x^4 - 9x^3 + 20x^2 + 27x - 9$ E. $12x^4 + 9x^3 + 20x^2 + 27x - 9$

21. Expand and simplify: $(3x+4)^2 - 3(x+5)$

- A. $9x^2 + 18x + 1$ B. $9x^2 + 21x + 1$ C. $9x^2 + 9x + 1$
 D. $9x^2 + 21x + 31$ E. $9x^2 + 9x + 31$

22. Factor: $x^2 - 4x - 12$

- A. $(x+6)(x-2)$ B. $(x+12)(x-1)$ C. $(x+2)(x-6)$ D. $(x+7)(x-3)$ E. $(x-4)(x+3)$

23. Factor: $2x^2 - 7xy - 15y^2$

- A. $(2x + 3y)(x - 5y)$ B. $(2x - 3y)(x + 5y)$ C. $(2x - y)(x - 15y)$
 D. $(2x - 5y)(x + 3y)$ E. $(2x + 5y)(x - 3y)$

 24. When $6x^2 + x - 15$ is factored completely, one of the factors will be _____

- A. $2x + 5$ B. $2x + 3$ C. $2x - 3$ D. $2x - 5$ E. $3x - 5$

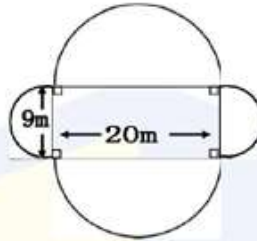
25. When $(4x - 7)^2 - 10(4x - 7) + 24$ is factored completely, one of the factors will be _____

- A. $4x + 13$ B. $4x + 3$ C. $x + 6$ D. $x + 4$ E. $4x - 11$

26. Factor completely: $xy - 5y - 2x + 10$

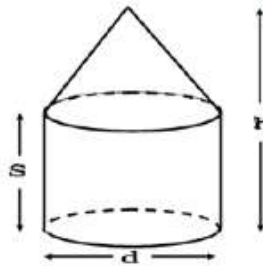
- A. $(x + 5)(y - 2)$ B. $(x - 5)(y + 2)$ C. $(x + 2)(y + 5)$ D. $(x - 5)(y - 2)$ E. $(x - 2)(y - 5)$

27. Find the area of the figure, in square meters, to 1 decimal place.



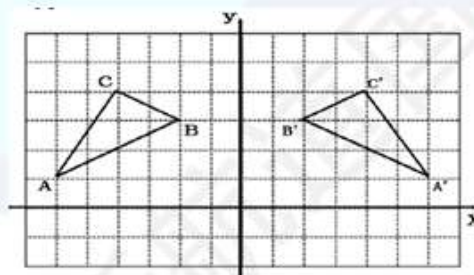
- A. 935.6 m^2 B. 1691.1 m^2 C. 362.2 m^2 D. 557.8 m^2 E. 271.1 m^2

28. Find the volume, in cubic centimeters, of the solid shown where $h = 12\text{cm}$, $s = 7\text{cm}$, and $d = 8\text{cm}$. Express your answer to two decimal places.



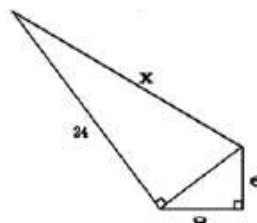
- A. 2077cm^3 B. 435.63cm^3 C. 1742.54cm^3 D. 217.82cm^3 E. 1258.96cm^3

29. In the diagram shown, $\triangle A'B'C'$ is the image of $\triangle ABC$. Which type of transformation is shown in the illustration?



- A. dilation B. translation C. slide D. rotation E. reflection

30. Find the length of side x .

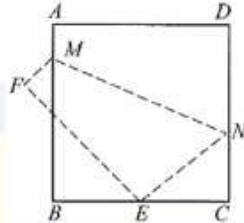


- A. 20 B. 34 C. 26 D. 25 E. 35

31. A triangle has vertices $A(-5, 2)$, $B(-3, 5)$, and $C(-2, 1)$. Which of the following translations will place the image triangle in the fourth quadrant?

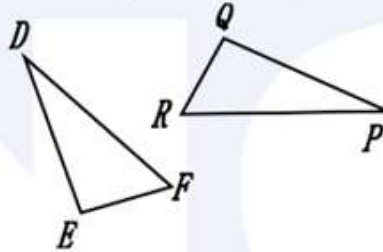
- A. 5 units left, 7 units down B. 6 units right, 7 units down C. 4 units left, 7 units up
D. 6 units right, 7 units up E. 4 units right, 7 units down

32. As shown in the diagram, fold square $ABCD$ with side length 8 cm so that point D falls on the midpoint of BC , E , and point A falls on F . The folding line is MN . Then the length of segment CN is



- A. 3 B. 4 C. 5 D. 6 E. 7

33. Given the $\triangle DEF$ is congruent to $\triangle PQR$, find the angle that is congruent to $\angle R$



- A. $\angle P$ B. $\angle F$ C. $\angle D$ D. $\angle Q$ E. $\angle E$

34. For $\text{Rt}\triangle ABC$, $\angle C=90^\circ$, $\angle B=30^\circ$, D is the midpoint of AB , $AD=2$, find the length of CD .

- A. 1 B. 2 C. 3 D. 4 E. 5

35. A 2.5 metre ladder leans against a house forming a 30° angle with the house. Exactly how far is the base of the ladder from the house?



- A. 1.35m B. 1.50m C. 2.25m D. 1.75m E. 1.25m

36. The scale shown on a map of Canada is $1\text{cm}=120\text{km}$. On the map the distance between Winnipeg and Saskatoon is 5.7cm . How far apart are Winnipeg and Saskatoon to the nearest kilometre?

- A. 444km B. 516km C. 684km D. 276km E. 660km

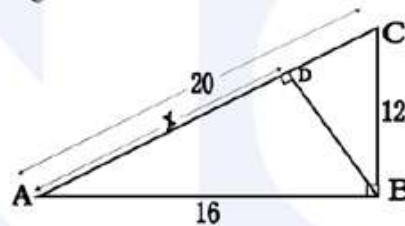
37. Evaluate: $(3^{-2} + 5^{-2})^{-1}$

- A. -34 B. $-\frac{1}{34}$ C. $\frac{225}{34}$ D. 34 E. $\frac{34}{225}$

38. Evaluate: $\frac{(3^8 \times 3^{-3})^4}{(3^4)^5}$

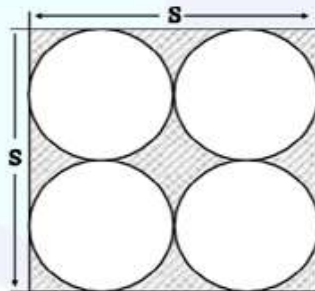
- A. 1 B. 6 C. $\frac{1}{27}$ D. $\frac{1}{3}$ E. 9

39. Find the value of x in this diagram.



- A. 8.8 B. 12.8 C. 9.6 D. 10.2 E. 7.2

40. Find the area of the shaded region where $S = 12$.



- A. 12.65 units^2 B. 30.90 units^2 C. 43.56 units^2 D. 3.90 units^2 E. 115.73 units^2

41. A right triangle has one leg of length a and a hypotenuse of length c . Express the area of this triangle in terms of a and c .

- A. $A = \frac{a\sqrt{c^2+a^2}}{2}$ B. $A = \frac{a(c-a)}{2}$ C. $A = \frac{c\sqrt{a^2-c^2}}{2}$ D. $A = \frac{ac}{2}$ E. $A = \frac{a\sqrt{c^2-a^2}}{2}$

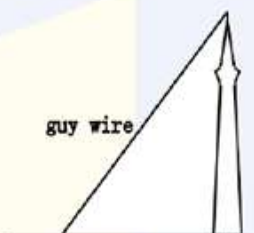
42. If $Ax^3 + 7x^2 + Bx + 30$ is evaluated for $x = -1$ the result is 54. When the expression is evaluated for $x = 2$ the result is 6. What is the value of A?

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

43. The perimeter of a rectangle is $18x + 24$ and the width is $2x - 9$. What is the length?

- A. $7x - 3$ B. $7x + 3$ C. $16x - 15$ D. $7x + 21$ E. $16x + 33$

44. A guy wire attached to the top of an 84m radio antenna is bolted to the ground 52m from the base of the tower. If the wire is tight, how long is the wire? Express your answer to the nearest hundredth of a metre.

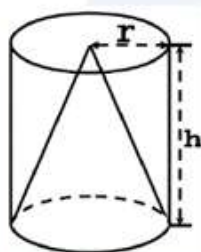


- A. 98.79cm B. 93.30cm C. 95.56cm D. 89.35cm E. 136.00cm

45. A rectangle has both of its sides increased by 20%. By what percent dose its area increase?

- A. 40% B. 44% C. 140% D. 84% E. 144%

46. A cone with radius $r = 3\text{cm}$ and height $h = 9\text{cm}$ just fits inside a cylinder with the same height and radius. How many cubic centimetres are in the space between the two figures. Round your answer to 2 decimal places.



- A. 85cm^3 B. 113cm^3 C. 236cm^3 D. 170cm^3 E. 57cm^3

47. The base of a triangle is 3 units more than the height, the area of the triangle is 28 square units. If the height is represented by x , which equation could be used to find the measure of the height of the triangle?

- A. $\frac{1}{2}(2x - 3) = 28$ B. $\frac{1}{2}x(x - 3) = 28$ C. $\frac{1}{2}x(x + 3) = 28$
 D. $x(x + 3) = 28$ E. $\frac{1}{2}(2x + 3) = 28$

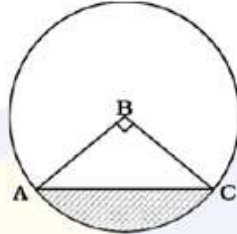
48. Simplify: $\frac{3x+5}{4} - \frac{6x-6}{8}$

- A. $\frac{1}{2}$ B. $\frac{-12x+5}{10}$ C. 16 D. 2 E. $\frac{-3x}{2}$

49. Solve $ax+b=cx+d$ ($a \neq c$)

- A. $x = \frac{b+d}{a+c}$ B. $x = \frac{d-b}{a-c}$ C. $x = \frac{d+b}{a-c}$ D. $x = \frac{d-b}{a-c}$ E. $x = \frac{d-b}{a+c}$

50. The radius of the circle is 12cm. What is the area of the shaded region?



- A. 46.8cm^2 B. 41.1cm^2 C. 76.8cm^2 D. 68.2cm^2 E. 86.4cm^2

51. There are 3 dots in the first figure and 7 dots in the second figure. If this pattern is continued, how many dots will be in the n th Figure? Show all your working.



52. If the pattern shown is continued, then what is the number at the end of the 30th row?

Show all your working.

```

      1
     2 3
    4 5 6
   7 8 9 10
  
```