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Mathematics, 2015 EC, Grade 8 national exam

Grade 8 · Mathematics · 2015 E.C.

Time allowed: 120 minutes | **Questions:** 40 | **Total marks:** 40

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1. The number $3\frac{1}{5}$ as a single fraction is equal to (1)

A. $\frac{16}{5}$ **B.** $\frac{4}{5}$
C. $\frac{14}{5}$ **D.** $\frac{9}{5}$

2. |-\frac{2}{3}| + \frac{1}{3} is equal to (1)

A. $\frac{1}{3}$ **B.** $\frac{2}{3}$
C. 1 **D.** -1

3. Which one of the following is true? (1)

A. $\frac{1}{2} < \frac{3}{5} < \frac{7}{10}$ **B.** $\frac{7}{10} < \frac{3}{5} < \frac{1}{2}$
C. $\frac{1}{2} < \frac{7}{10} < \frac{3}{5}$ **D.** $\frac{3}{5} < \frac{7}{10} < \frac{1}{2}$

4. \frac{3}{7} + \frac{1}{2} = (1)

A. $\frac{5}{14}$ **B.** $\frac{4}{9}$
C. $\frac{2}{7}$ **D.** $\frac{13}{14}$

5. The sum of two rational numbers is 3. If one of the numbers is $\frac{9}{4}$, then the other number is (1)

A. $\frac{3}{4}$ **B.** $\frac{21}{4}$
C. $\frac{1}{2}$ **D.** $\frac{2}{3}$

6. $\left(-\frac{3}{4}\right) \times \left(-\frac{10}{9}\right) =$ (1)

A. $\frac{27}{40}$ **B.** $\frac{5}{6}$
C. $-\frac{27}{40}$ **D.** $-\frac{5}{6}$

7. If we divide $4\frac{1}{3}$ by $\frac{1}{6}$, the result is (1)

A. $4\frac{1}{18}$ **B.** 26
C. 8 **D.** $\frac{13}{18}$

8. A bag contained 8.2kg of three type fruits. 2.5kg orange, 2.2kg banana and the rest is apple. Then the amount of apple is (1)

A. 2.5kg **B.** 2.8 kg
C. 3.5kg **D.** 4.2kg

9. Which one of the following numbers is a squared number? (1)

A. 2 **B.** 4
C. 6 **D.** 8

10. The area of a square is 196cm^2. What is the length of one side of the square? (1)

A. 11cm
B. 13cm
C. 14cm
D. 19cm

11. 11. Table 1 yields the value $y = x^2, 1 \leq x \leq 1.49$ (1)

X	0	1	2	3	4	5	6	7	8	9
1.0	1.000	1.020	1.040	1.061	1.082	1.102	1.124	1.145	1.166	1.188
1.1	1.210	1.232	1.254	1.277	1.277	1.322	1.346	1.369	1.392	1.416
1.2	1.440	1.464	1.488	1.513	1.538	1.562	1.588	1.613	1.638	1.644
1.3	1.690	1.716	1.742	1.769	1.796	1.822	1.855	1.877	1.904	1.932
1.4	1.960	1.988	2.016	2.045	2.074	2.102	2.132	2.161	1.190	2.220

By using the table $\sqrt{2.016}$ is equal to

A. 1.32
B. 1.40
C. 1.42
D. 1.46

12. 12. $\left(\frac{3}{4}\right)^3 =$ ____ (1)

A. $\frac{9}{16}$
B. $\frac{27}{16}$
C. $\frac{27}{64}$
D. $\frac{9}{64}$

13. 13. $\sqrt[3]{-64} =$ _____ (1)

A. 4
B. -4
C. -8
D. 8

14. 14. The volume of cubic box with side length equal to $\frac{1}{2}$ m is (1)

A. $4\ \text{m}^3$
B. $\frac{1}{4}\ \text{m}^3$
C. $\frac{1}{8}\ \text{m}^3$
D. $8\ \text{m}^3$

15. A point (x, y) is located in the fourth quadrant. Then which one of the following is true about the coordinates of the point? (1)

A. $x > 0$ and $y > 0$
B. $x > 0$ and $y < 0$
C. $x < 0$ and $y > 0$
D. $x < 0$ and $y < 0$

16. Which one of the following points is not on a line shown in Figure 1? (1)

[Figure: A Cartesian coordinate grid labeled "Figure 1" showing a straight line. The line has a positive slope and passes through the y-intercept at $(0, -3)$ and the x-intercept at $(3, 0)$, as well as points $(1, -2)$, $(2, -1)$, and $(4, 1)$.]

A. $(-1, -2)$
B. $(2, -1)$
C. $(3, 0)$
D. $(0, -3)$

17. The solution of $2x + 3 < x - 1$ is (1)

A. $x > 3$
B. $x < -3$
C. $x < -4$
D. $x < 2$

18. The sum of two consecutive integers x and y is less than 55. If x is the smaller number in the sum, then (1)

A. $x < 54$
B. $x < 27$
C. $x > 54$
D. $x < 18$

19. Sum of two numbers is 95. If one exceeds the other by 15, then the smaller number in the sum is (1)

A. 25 **B.** 30

C. 35 **D.** 40

20. Which one of the following are not necessarily similar figures? (1)

A. Any two triangles with their corresponding angles are equal.

B. Any two triangles with their corresponding sides are equal.

C. Any two right angled triangles with one of their angles 35^0

D. Any two triangles with their altitude are equal.

21. Assume that ΔABC is similar to ΔDEF. If $AB = 7$, $AC = 15$, $DF = 6$and $EF = 4$ then $BC =$ _____ (1)

A. $\frac{14}{5}$ **B.** 10

C. $\frac{56}{5}$ **D.** $\frac{24}{5}$

22. Assume that ΔABC is similar to ΔDEF. If $AB = 4\text{cm}$, $BC = 5\text{cm}$, $AC = 8\text{cm}$ and $DE = 8\text{cm}$, then perimeter of $\Delta DEF =$ _____ (1)

A. 17cm **B.** 25cm

C. 34cm **D.** $\frac{17}{2}\text{cm}$

23. The ratio of the corresponding sides of similar triangles is $\frac{2}{3}$. If the area of the smaller triangle is 12cm^2, then the area of the larger triangle is (1)

A. 27cm^2 **B.** 16cm^2

C. 18cm^2 **D.** 15cm^2

24. The degree measure of angles of a triangle are x^0, $2x^0$ and 60^0. Then the value of x is (1)

A. 10 **B.** 20

C. 40 **D.** 50

25. In the Figure 2, shown below the degree measure of $\angle ACB$ is equal to (1)

[Figure: A triangle ABC is shown, labelled 'Figure 2'. Side BA is extended downwards past vertex A. The exterior angle between the extension of BA and side AC is labelled 135^0. The interior angle at vertex B is labelled $x + 5$. The interior angle at vertex C ($\angle ACB$) is labelled x.]

A. 30^0 **B.** 45^0

C. 60^0 **D.** 65^0

26. In the Figure 3, below the value of x is (1)

[Figure: A right triangle is shown with its right angle at the top vertex, labelled 'Figure 3'. An altitude is drawn from the top right-angled vertex perpendicular to the bottom hypotenuse, dividing it into two segments of length 5 (left segment) and 15 (right segment). The left leg of the triangle is labelled x.]

A. 4 **B.** 6

C. 10 **D.** $\sqrt{75}$

27. Which one of the following triplets does not represent lengths of sides of right angled triangle? (1)

A. 2cm, 3cm, 6cm **B.** 3cm, 4cm, 5cm

C. 5cm, 12cm, 13cm **D.** 6cm, 8cm, 10cm

28. Consider the circle shown in the Figure 4. If O is the center of the circle, which one of the following is not true? (1)

[Figure: A circle with center labelled O is shown, labelled 'Figure 4'. A horizontal line with arrows at both ends, labelled with point A on the left and point B on the right, is tangent to the top of the circle at point D. A secant line passes through point D and another point C on the lower-left boundary of the circle, extending outside the circle with arrows at both ends; this line does not pass through the center O. A horizontal line segment inside the circle below center O connects point E on the left to point F on the right.]

A. Line $\overline{AB}$ is tangent line to the circle.

B. Line $\overline{CD}$ is a secant line to the circle.

C. Line segment $\overline{EF}$ is a chord of the circle.

D. Line segment $\overline{CD}$ is a diameter.

29. 29. In Figure 5 , if $m(\overparen{AB}) = 72^0$, then $m(\angle ACB)$ is __ (1)

[Figure: Figure 5 shows a circle with points A and B on the upper circumference, and point C on the lower-left circumference. Chords AC and BC meet at point C to form an inscribed angle ACB subtending arc AB, with the measure of arc AB indicated as 72°.]

A. 36^0

B. 45^0

C. 72^0

D. 144^0

30. 30. In the Figure 6, O is the center and $\overline{AB}$ a line segment that pass through O. If $m(\overparen{AE}) = 66^0$ and $(\overparen{ED}) = 49^0$ then $m(\angle DOB)$ is equal to (1)

[Figure: Figure 6 shows a circle with center O and diameter AB passing horizontally through O. On the upper semicircle, points E and D lie on the arc between A and B, with radii OE and OD drawn. A point C lies on the lower circumference with line segment OC drawn. Arc AE has a measure of 66° and arc ED has a measure of 49°.]

A. 65^0

B. 70^0

C. 72^0

D. 98^0

31. 31. A circular pizza in Figure 7 was cut into three parts in such a way that the arc length of each part are equal. What is the degree measure of $\angle BAC$? (1)

[Figure: Figure 7 depicts a circular pizza shown in perspective, divided into three sectors meeting at center point A. Radii AB and AC define a shaded sector BAC, where the arc lengths of all three sectors along the circumference are equal.]

A. 30^0

B. 45^0

C. 60^0

D. 120^0

32. 32. In the prism shown in Figure 8, which one of the following is a base? (1)

[Figure: Figure 8 shows a triangular prism lying on its side. The front triangular face has vertices A (bottom-left), E (top-left), and B (bottom-right) connected by solid edges AE, EB, and AB. The rear triangular face has vertices C (bottom-left, hidden), F (top-right), and D (bottom-right) with edges CF and CD dashed, and edge FD solid. The lateral edges connecting corresponding vertices are EF (solid, top), BD (solid, bottom-right), and AC (dashed, bottom-left).]

A. Rectangle ABDC

B. Rectangle EBDF

C. Rectangle AEFC

D. Triangle AEB

33. The total surface area of a pyramid shown in Figure 9 is (1)

[Figure: A triangular prism labeled 'Figure 9'. The triangular face has perpendicular legs labeled 12cm (vertical) and 5cm (horizontal). The length of the prism extending between the two triangular bases is labeled 7cm.]

A. $420\ \text{cm}^2$

B. $300\ \text{cm}^2$

C. $270\ \text{cm}^2$

D. $179\ \text{cm}^2$

34. The total surface area of a cylinder with radius 1m and height 3m is (1)

A. $2\pi\ \mathrm{m}^2$ **B.** $3\pi\ \mathrm{m}^2$

C. $8\pi\ \mathrm{m}^2$ **D.** $9\pi\ \mathrm{m}^2$

35. The volume of a right circular cylinder with height 3cm and base radius 2cm is (1)

A. $6\pi\ \mathrm{cm}^3$ **B.** $12\pi\ \mathrm{cm}^3$

C. $16\pi\ \mathrm{cm}^3$ **D.** $20\pi\ \mathrm{cm}^3$

36. A cylindrical tanker of radius 2m and height 4m contains $8\pi\ \mathrm{m}^3$ water. How much cubic meter of water is required to fill the tanker? (1)

A. $2\pi\ \mathrm{m}^3$ **B.** $6\pi\ \mathrm{m}^3$

C. $4\pi\ \mathrm{m}^3$ **D.** $8\pi\ \mathrm{m}^3$

37. The probability of an impossible event is (1)

A. 0 **B.** $\frac{1}{4}$

C. $\frac{1}{2}$ **D.** 1

38. The probability of choosing a letter 'I' randomly from the letters of the word 'PHILIPPINES' is (1)

A. $\frac{3}{11}$ **B.** $\frac{3}{7}$

C. $\frac{4}{9}$ **D.** $\frac{5}{11}$

39. 39. A box contains 12 cards numbered from 1 to 12. One card is drawn randomly from the box. The probability of the number to be odd is (1)

A. $\frac{1}{12}$ **B.** $\frac{1}{2}$

C. $\frac{2}{3}$ **D.** $\frac{1}{4}$

40. 40. Assume that the arrow in Figure 10 point to the numbers 1,2,3,...12 only. What is the probability of pointing to an odd number? (1)

[Figure: Figure 10 shows a circular dial resembling a clock face with tick marks and the numbers 1 through 12 arranged clockwise around the circumference (12 at the top, 3 at the right, 6 at the bottom, and 9 at the left). A pointer originates at the center and points toward the number 2.]

A. $\frac{1}{2}$ **B.** $\frac{1}{12}$

C. $\frac{3}{4}$ **D.** $\frac{2}{3}$

END OF THE EXAMINATION

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