

B NUMBER <i>(Number Concepts)</i>	B3 classify numbers as natural, whole, integer, rational or irrational, and show that these number sets are “nested” within the real number system
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Knowledge

Prescribed Learning Outcomes – B3

Match each Real Number on the left with its most Restrictive Category on the right. Each Restrictive Category may be used once, more than once or not at all.	
Real Number	Restrictive Category
11. π	A. Rational
12. 0	B. Irrational
13. -5	C. Whole
14. $\sqrt{2}$	D. Natural
15. 1000	E. Integer
16. $\frac{3}{4}$	
17. $\sqrt{9}$	
18. 0.565656...	
19. 5.121121112...	
20. $-1.15\overline{82}$	

Answers

- 11. B
- 12. C
- 13. E
- 14. B
- 15. D
- 16. A
- 17. D
- 18. A
- 19. B
- 20. A

21. To which set(s) of numbers does 8 belong?

<input checked="" type="checkbox"/> I.	Natural
<input checked="" type="checkbox"/> II.	Integer
<input checked="" type="checkbox"/> III.	Rational

- A. I only
 B. I and II only
 C. I and III only
 * D. I, II and III

Shade in Bubble A if the statement is always true.
Shade in Bubble B if the statement is sometimes true.
Shade in Bubble C if the statement is never true.

Questions

22. An integer is a whole number.
 23. A whole number is an integer.
 24. An irrational number is an integer.
 25. A repeating decimal is an irrational number.
 26. A real number is an irrational number.
 27. A non-repeating non-terminating decimal is an irrational number.
 28. An irrational number is a real number.

Answers

22. B
 23. A
 24. C
 25. C
 26. B
 27. A
 28. A

B NUMBER (Number Operations)	B5 perform arithmetic operations on irrational numbers, using appropriate decimal approximations
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Knowledge

Prescribed Learning Outcomes – B5

29. Evaluate $\sqrt[3]{28} + 2$ to two decimal places.

Answer

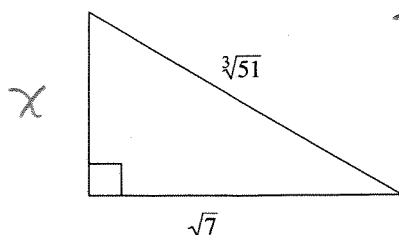
5.04

You should have a $\sqrt[3]{\quad}$ or $\sqrt[3]{y}$ button on your calculator to evaluate $\sqrt[3]{28}$. Try it out and see if you get 3.04. You may have to try 2 or 3 different ways.

Understanding

Prescribed Learning Outcomes – B5; A5, A7, A9

Use the following diagram to answer question 30.



Perimeter = sum of all sides
 \therefore must find 'x'

30. What is the perimeter of the triangle to two decimal places?

Answer

8.95

$$x^2 + (\sqrt{7})^2 = (\sqrt[3]{51})^2$$

$$x^2 + 7 = (3.708)^2$$

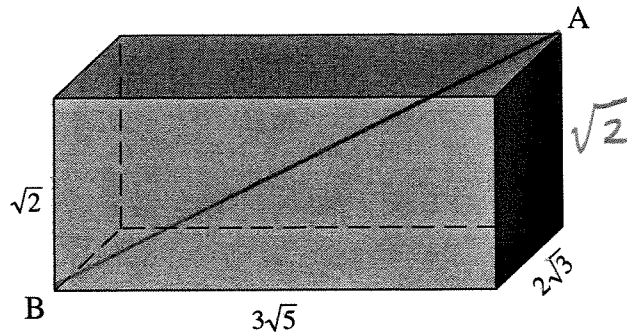
$$x^2 = 6.752$$

$$x = 2.599$$

$$\therefore P = 2.599 + \sqrt{7} + \sqrt[3]{51}$$

$$P = \underline{\underline{8.95}}$$

Use the following diagram to answer question 31.



31. What is the length of diagonal AB? Answer to two decimal places.

Answer

7.68

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

$$BA^2 = 45 + 12 + 2$$

$$\sqrt{BA^2} = \sqrt{59}$$

$$BA = 7.68$$

B NUMBER (Number Operations)	B8 perform operations on irrational numbers of monomial and binomial form, using exact values
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Knowledge

Prescribed Learning Outcomes – B8

32. Simplify $2\sqrt{50} + \sqrt{32}$
- A. $\sqrt{132}$
- B. $4\sqrt{5} + 4\sqrt{2}$
- C. $2\sqrt{82}$
- * D. $14\sqrt{2}$

$$\begin{aligned}
 &= 2\sqrt{5 \cdot 5 \cdot 2} + \sqrt{16 \cdot 2} \\
 &= 10\sqrt{2} + 4\sqrt{2} \\
 &= 14\sqrt{2}
 \end{aligned}$$

Understanding

Prescribed Learning Outcomes – B8

33. Fill in the blank with the number which would make the following equation a true statement.

$$[-3\sqrt{6} \times -2\sqrt{24}] = -\sqrt{18} \times \underline{\hspace{2cm}}$$

- A. $6\sqrt{12} = 12\sqrt{3}$
- B. $6\sqrt{8} = 12\sqrt{2}$
- C. $-6\sqrt{12} = -12\sqrt{3}$
- * D. $-6\sqrt{8} = -12\sqrt{2}$

$$6\sqrt{6 \cdot 6 \cdot 4} = -\sqrt{3 \cdot 3 \cdot 2} \cdot x$$

$$6 \cdot 6 \cdot 2 = -3\sqrt{2} \cdot x$$

$$72 = -3\sqrt{2} \cdot x$$

$$\therefore \frac{72}{-3\sqrt{2}} = x$$

$$\frac{72}{-3\sqrt{2}} \cdot \frac{\sqrt{2}}{\sqrt{2}} = x \quad \therefore \underline{\underline{x = -12\sqrt{2}}}$$

$$\frac{72\sqrt{2}}{-6} = x$$