



education

Department of
Education
FREE STATE PROVINCE

GRADE 9

MATHEMATICS ITEMS BANK FOR INTEGERS EXAMINATION

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PURPOSE OF THE DOCUMENT

- TO GUIDE TEACHERS ON THE DEPTH OF THEIR PLANNING AND PREPARATION.
- TO HELP BOTH DHs AND TEACHERS TO DETERMINING CURRICULUM COVERAGE.
- TO HELP TEACHERS TO SET THEIR OWN STANDARDISED PAPERS AND TO HELP DHs TO MODERATE THE PAPERS WITH EASY.
- TO HELP IN CONTINUOUSLY PREPARING LEARNERS FOR TIMSS AND GEC PAPERS SINCE SOME QUESTIONS ARE TAKEN FROM TIMSS AND GEC PREVIOUS PAPERS.
- TO HELP TEACHERS TO SET THEIR OWN WEEKLY, BIWEEKLY AND OR MONTHLY TESTS.

NB: THE DOCUMENT IS MEANT FOR TEACHERS NOT LEARNERS. LEARNERS WILL INTERACT WITH THE DOCUMENT VIA FORMATIVE OR SUMMATIVE ASSESSMENT.

INTEGERS

CALCULATIONS WITH INTEGERS

• Revise:

- Perform calculations involving all four operations with integers
- Perform calculations involving all four operations with numbers that involve the squares, cubes, square roots and cube roots of integers

Routine Procedure

Calculations involving all four operations

1. Without using a calculator, calculate the following using the correct order of operations:

1.1 $200 \div (25 \times 4) - 2 \times 6 + 12 \div 3$ (4)

1.2 $(16)(-4) \div (34 - 2)$ (4)

1.3 $-5 - 3[-7 - (-6)]^2$ (4)

1.4 $(-9 + 3)^2 \div (-6 \times 3)$ (4)

Calculations involving exponents and roots

2. Without using a calculator, calculate the following using the correct order of operations:

2.1 $4^2 + 3^3$ (4)

2.2 $(4 - 2^2)^2$ (4)

2.3 $\sqrt[3]{-15 - [(-2)^2 \times 3]}$ (4)

2.4 $\sqrt{9} + \sqrt[3]{4 - 68}$ (4)

2.5 $(50 - \sqrt[3]{1000}) \times (2 + 1^3)$ (4)

2.6 $216 - 16 \div \sqrt[3]{-64} \times 2$ (4)

2.7 $\frac{-\sqrt{25}-5}{5}$ (3)

2.8 $\frac{\sqrt{64}+\sqrt{10+6}}{\sqrt[3]{27}-\sqrt[3]{100+25}}$ (4)

2.9 $\frac{\sqrt{25-9}}{\sqrt{64+36}} - \frac{(-2)^3}{\sqrt[3]{125}}$ (4)

- 2.10 $\sqrt[3]{\sqrt{49} + \sqrt{25} - \sqrt{16}}$ (4)
- 2.11 $-\sqrt[3]{(-5)^2 - \sqrt{169} \times 2^2}$ (4)
- 2.12 $\sqrt{9 + \sqrt[3]{27} + 4 \times 6}$ (4)
- 2.13 $\sqrt{(-3)^2 + (-3)^3 \div \sqrt{-729} - (-2^2)}$ (4)
3. $3(-2 + 6) - 2(5 - 4 + 1) = \dots$ (1)
- A 16 B 8 C 11 D 7
10. $\frac{2(-3) - (5) - 4(6 \div 8)}{5 - 6} = \dots$ (1)
- A 15 B 2 C 14 D 3
11. $\sqrt{49} - 2^3 + \sqrt[3]{216} \div 3 = \dots$ (1)
- A 1 B $1\frac{2}{3}$ C -1 D $2\frac{1}{3}$
11. $\sqrt[3]{\frac{\sqrt[3]{-64+5}}{4^2+3^2}} = \dots$ (1)
- A $\frac{1}{7}$ B $-\frac{3}{5}$ C $\frac{1}{5}$ D $-\frac{3}{7}$

PROPERTIES OF INTEGERS

- Recognise and use commutative, associative and distributive properties of addition and multiplication for integers
- Recognize and use additive and multiplicative inverses for integers

Routine Procedure

Knowledge

Recognizing

1. Which expression represents the associative property in $(-a \times b)(e \times -g)$? (1)
- | | |
|--------------------------------|----------------------------------|
| A $(-a + e)(b - g)$ | B $(-a - g) \times (b \times e)$ |
| C $(-a \times e)(b \times -g)$ | D $(-a + b)(e - g)$ |

2. Which expression represents the associative property in $(-4 + 7) \times 11$? (1)
- | | |
|--------------------------------------|------------------------------------|
| A $(-4 \times 11) + [(-4) \times 7]$ | B $-4 \times (7 \times 11)$ |
| C $-4 + (7 \times 11)$ | D $(-4 \times 11) + (7 \times 11)$ |

Use

1. By using the commutative, associative and/or associative properties, calculate:
- | | |
|---|-----|
| 1.1 $16 - 83 + 82 - 6$ | (4) |
| 1.3 $-33 + 103 - 102 + 3$ | (4) |
| 1.4 $-25 \times 12 \times -20 \times 5 \times -8$ | (4) |
| 1.5 $-10(3 - 13)$ | (3) |
| 1.6 -25×96 | (4) |

SOLVING PROBLEMS

- Solve problems in contexts involving multiple operations with integer

Routine Procedure

1. The highest temperature in South Africa is recorded as 50°C and the lowest as -20°C . What is the difference between these two temperatures? (4)
2. How much warmer is a temperature of -39°C than a temperature of -114°C ? (4)
3. Siberia has one of the coldest temperatures of -71°C while Death Valley in California has one of the hottest temperatures of 56°C . How much warmer is Death Valley? (4)
4. A man parks at basement level -4 below a large building. He goes up 15 levels and then down 7 levels. How many levels is he above his car at this point? (4)

2003 TIMSS ITEMS

42. What is the value of $1 - 5 \times (-2)$? (1)
A 11 B 8 C -8 D -9
43. If n is a negative integer, which of these is the largest number? (1)
A $3 + n$ B $3 \times n$
C $3 - n$ D $3 \div n$