Math 10C Midterm

Name:_____

Version 1

Multiple Choice

Identify the choice that best completes the statement or answers the question.

____ 1. A right pyramid has a square base with side length 12 m and a height of 9 m. Calculate the surface area of the pyramid to the nearest square metre.

a. 360 m^2 b. 519 m^2 c. 779 m^2 d. 404 m^2

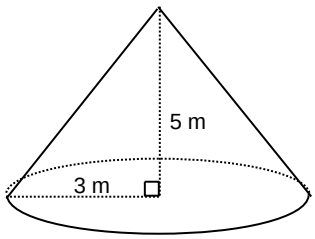
____ 2. Baseboards are sold in 8-ft. lengths. Nelia requires 80 yd. of baseboard. How many 8-ft. lengths does Nelia need to purchase?

a. 32 b. 31 c. 29 d. 30

____ 3. A rope that supports a canopy is 8.5 m long. The rope is attached to the canopy at a point that is 7.5 m above the ground. What is the angle of inclination of the rope to the nearest tenth of a degree?

a. 48.6° b. 61.9° c. 28.1° d. 41.4°

____ 4. Determine the surface area of this right cone to the nearest square metre.



a. 74 m^2 b. 55 m^2 c. 75 m^2 d. 83 m^2

____ 5. A right cone has a height of 16 in. and a base diameter of 9 in. Determine the lateral area of the cone to the nearest square inch.

a. 226 square inches c. 299 square inches
b. 235 square inches d. 260 square inches

____ 6. Determine the greatest common factor of 108, 180, and 288.

a. 12 b. 4320 c. 18 d. 36

____ 7. A cube has surface area 3750 square feet. What is its volume?

a. 5625 cubic feet
b. 25 cubic feet
c. 1448 cubic feet
d. 15 625 cubic feet

____ 8. Factor the trinomial $32a^2b - 40ab + 72ab^2$.

a. $8ab(4a - 5 + 9b)$
b. $8ab(4a - 5ab + 9b)$
c. $ab(32a - 40 + 72b)$
d. $8(4a^2b - 5ab + 9ab^2)$

____ 9. Terry is lying on the ground near the B.C. Legislature Building. The angle between the ground and his line of sight to the highest point on the building is 49°. The height of the building, from the ground to its highest point, is about 44 m. About how far is Terry from a point on the ground vertically below the highest point on the building? Give the answer to the nearest metre.

a. 67 m b. 51 m c. 33 m d. 38 m

____ 10. A 40-ft. guy wire helps to support a tower. The wire is anchored to the ground 19 ft. from the base of the tower. What is the measure of the angle formed between the wire and the ground, to the nearest degree?

a. 62° b. 65° c. 25° d. 28°

____ 11. Factor: $24b^2 + 34bc - 3c^2$

a. $(2b + 3c)(12b - c)$
b. $(24b - 3c)(b - c)$
c. $(8b + c)(3b - 3c)$
d. $(2b - 3c)(12b + c)$

____ 12. Calculate the angle of inclination, to the nearest tenth of a degree, of a road with a grade of 17%.

a. 80.2° b. 80.4° c. 9.6° d. 9.8°

____ 13. A right square pyramid has a base side length of 9 ft. and a slant height of 17 ft. Calculate the volume of the pyramid to the nearest cubic foot.

a. 443 cubic feet b. 1328 cubic feet c. 387 cubic feet d. 459 cubic feet

____ 14. Convert 160 cm to feet and the nearest inch.

a. 5 ft. 6 in. b. 6 ft. 4 in. c. 5 ft. 2 in. d. 5 ft. 4 in.

____ 15. The navigator of a ship at sea sees a lighthouse due north of the ship. The ship then sails 2.7 km due west. The angle between the ship's path and the line of sight to the lighthouse is 33.1°. How far is the ship from the lighthouse to the nearest tenth of a kilometre?

a. 4.9 km b. 2.3 km c. 4.1 km d. 3.2 km

____ 16. A rope that anchors a hot air balloon to the ground is 131 m long. The balloon is 60 m above the ground. What is the angle of inclination of the rope to the nearest tenth of a degree?

a. 62.7° b. 65.4° c. 27.3° d. 24.6°

____ 17. Factor: $-5m^2 + 20m + 60$

a. $-5(m + 2)(m - 6)$ c. $-5(m - 3)(m + 4)$

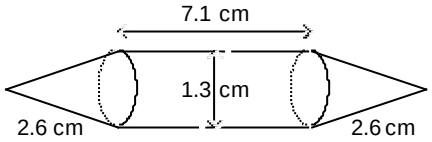
b. $-5(m - 2)(m + 6)$ d. $-5(m + 3)(m - 4)$

____ 18. Expand and simplify: $(6p + 3)(6p - 7) - (3p - 8)(p - 2)$

a. $33p^2 - 38p - 5$ c. $33p^2 - 10p - 37$

b. $33p^2 - 10p - 5$ d. $33p^2 - 38p - 37$

____ 19. Determine the surface area of this composite object, which is a right cylinder and two right cones, to the nearest square centimetre.



a. 37 cm^2 b. 42 cm^2 c. 34 cm^2 d. 40 cm^2

____ 20. Factor: $243 - 3w^4$

a. $(9 - w^2)(27 - w^2)$ c. $3(9 - w^2)^2$

b. $3(9 + w^2)(3 + w)(3 - w)$ d. $3(9 + w^2)^2$

____ 21. Two guy wires are attached to the top of a radio tower. The wires are 65 ft. and 52 ft. long. The longer wire is anchored to the ground at a point 56 ft. from the base of the tower. The shorter wire is anchored to the ground at a point between the base of the tower and the longer wire. Calculate the angle of inclination of the shorter guy wire to the nearest tenth of a degree.

a. 39.4° b. 50.6° c. 30.5° d. 32.4°

____ 22. A map of Alberta has a scale of 1:1 505 000. The distance on the map between Calgary and Red Deer is $3\frac{1}{4}$ in. What is this distance to the nearest mile?

a. 232 mi. c. 308 mi.

b. 77 mi. d. 26 mi.

____ 23. To which set(s) of numbers does $-\sqrt{49}$ belong?

I	Natural
II	Integer
III	Rational
IV	Irrational

a. II and III only b. III only c. I, II and III only d. IV only

____ 24. Write $3\sqrt[3]{25}$ as an entire radical.

a. $\sqrt[3]{675}$ b. $\sqrt[3]{5625}$ c. $\sqrt[3]{225}$ d. $\sqrt[3]{46\,875}$

____ 25. Write $\sqrt[3]{5400}$ in simplest form.

a. $6\sqrt[3]{150}$ b. $25\sqrt[3]{6}$ c. $30\sqrt[3]{6}$ d. $6\sqrt[3]{25}$

____ 26. A cube has a volume of 686 cm^3. Determine the edge length of the cube as a radical in simplest form.

a. $7\sqrt[3]{14}$ cm b. $7\sqrt[3]{2}$ cm c. $49\sqrt[3]{2}$ cm d. $2\sqrt[3]{7}$ cm

___ 27. Write $42^{\frac{5}{2}}$ as a radical.

a. $\sqrt[5]{42^2}$ b. $\left(\sqrt{42}\right)^5$ c. $\sqrt[25]{42}$ d. $\left(\sqrt[5]{42}\right)^2$

____ 28. Simplify $\dfrac{\left(3.4^{-5}\right)\left(3.4^{5}\right)}{3.4^{-3}}$ by writing as a single power.

a. 3.4^{3} b. 3.4^{-22} c. 3.4^{-3} d. 3.4^{-3}

____ 29. Simplify $\left(7s^{\frac{3}{4}}t^{-\frac{2}{3}}\right)\left(-6s^{-\frac{7}{4}}t^{\frac{4}{3}}\right)$.

a. $-\dfrac{42t^{\frac{2}{3}}}{s}$ b. $-\dfrac{42}{st^2}$ c. $-42st^{\frac{2}{3}}$ d. $\dfrac{t^{\frac{2}{3}}}{42s}$

____ 30. Simplify $\left(\frac{5}{2}a^{-4}b^{5}\right)^{-3}$.

a. $\dfrac{125b^{15}}{8a^{12}}$ b. $\dfrac{8a^{12}}{125b^{15}}$ c. $\dfrac{125a^{12}}{8b^{15}}$ d. $\dfrac{8b^{2}}{125a^{7}}$

____ 31. Simplify $\dfrac{\left(m^{6}n^{-2}\right)^{-1}}{\left(m^{-5}n\right)^{3}}$.

a. $\dfrac{m^9}{n^5}$ b. $\dfrac{m^9}{n}$ c. $\dfrac{m^{21}}{n}$ d. $\dfrac{m^{21}}{n^5}$

Math -- Answer Section Version A

MULTIPLE CHOICE

1. ANS: D PTS: 1 DIF: Moderate
   REF: 1.4 Surface Areas of Right Pyramids and Right Cones LOC: 10.M3
   TOP: Measurement KEY: Procedural Knowledge
2. ANS: B PTS: 1 DIF: Moderate REF: 1.1 Imperial Measures of Length
   LOC: 10.M2 TOP: Measurement KEY: Procedural Knowledge
3. ANS: B PTS: 1 DIF: Moderate REF: 2.4 The Sine and Cosine Ratios
   LOC: 10.M4 TOP: Measurement KEY: Procedural Knowledge
4. ANS: D PTS: 1 DIF: Moderate
   REF: 1.4 Surface Areas of Right Pyramids and Right Cones LOC: 10.M3
   TOP: Measurement KEY: Procedural Knowledge
5. ANS: B PTS: 1 DIF: Moderate
   REF: 1.4 Surface Areas of Right Pyramids and Right Cones LOC: 10.M3
   TOP: Measurement KEY: Procedural Knowledge
6. ANS: D PTS: 1 DIF: Moderate
   REF: 3.1 Factors and Multiples of Whole Numbers LOC: 10.AN1
   TOP: Algebra and Number KEY: Procedural Knowledge
7. ANS: D PTS: 1 DIF: Moderate
   REF: 3.2 Perfect Squares, Perfect Cubes, and Their Roots LOC: 10.AN1
   TOP: Algebra and Number KEY: Procedural Knowledge
8. ANS: A PTS: 1 DIF: Moderate
   REF: 3.3 Common Factors of a Polynomial LOC: 10.AN5
   TOP: Algebra and Number KEY: Procedural Knowledge
9. ANS: D PTS: 1 DIF: Moderate
   REF: 2.2 Using the Tangent Ratio to Calculate Lengths LOC: 10.M4
   TOP: Measurement KEY: Procedural Knowledge
10. ANS: A PTS: 1 DIF: Moderate REF: 2.4 The Sine and Cosine Ratios
    LOC: 10.M4 TOP: Measurement KEY: Procedural Knowledge
11. ANS: A PTS: 1 DIF: Moderate REF: 3.8 Factoring Special Polynomials
    LOC: 10.AN5 TOP: Algebra and Number KEY: Procedural Knowledge
12. ANS: C PTS: 1 DIF: Moderate REF: 2.1 The Tangent Ratio
    LOC: 10.M4 TOP: Measurement KEY: Procedural Knowledge
13. ANS: A PTS: 1 DIF: Moderate
    REF: 1.5 Volumes of Right Pyramids and Right Cones LOC: 10.M3
    TOP: Measurement KEY: Procedural Knowledge
14. ANS: D PTS: 1 DIF: Moderate REF: 1.3 Relating SI and Imperial Units
    LOC: 10.M2 TOP: Measurement KEY: Procedural Knowledge
15. ANS: D PTS: 1 DIF: Moderate
    REF: 2.5 Using the Sine and Cosine Ratios to Calculate Lengths
    LOC: 10.M4 TOP: Measurement KEY: Procedural Knowledge
16. ANS: C PTS: 1 DIF: Moderate REF: 2.4 The Sine and Cosine Ratios
    LOC: 10.M4 TOP: Measurement KEY: Procedural Knowledge
17. ANS: A PTS: 1 DIF: Moderate
    REF: 3.5 Polynomials of the Form x^2 + bx + c LOC: 10.AN5
    TOP: Algebra and Number KEY: Procedural Knowledge

18. ANS: C PTS: 1 DIF: Moderate REF: 3.7 Multiplying Polynomials
LOC: 10.AN4 TOP: Algebra and Number KEY: Procedural Knowledge
19. ANS: D PTS: 1 DIF: Moderate
REF: 1.7 Solving Problems Involving Objects LOC: 10.M3
TOP: Measurement KEY: Procedural Knowledge
20. ANS: B PTS: 1 DIF: Moderate REF: 3.8 Factoring Special Polynomials
LOC: 10.AN5 TOP: Algebra and Number KEY: Procedural Knowledge
21. ANS: A PTS: 1 DIF: Moderate
REF: 2.7 Solving Problems Involving More than One Right Triangle
LOC: 10.M4 TOP: Measurement KEY: Procedural Knowledge
22. ANS: B PTS: 1 DIF: Moderate REF: 1.1 Imperial Measures of Length
LOC: 10.M2 TOP: Measurement KEY: Procedural Knowledge
23. ANS: A PTS: 1 DIF: Easy REF: 4.2 Irrational Numbers
LOC: 10.AN2 TOP: Algebra and Number KEY: Conceptual Understanding
24. ANS: A PTS: 1 DIF: Easy REF: 4.3 Mixed and Entire Radicals
LOC: 10.AN2 TOP: Algebra and Number KEY: Conceptual Understanding
25. ANS: D PTS: 1 DIF: Moderate REF: 4.3 Mixed and Entire Radicals
LOC: 10.AN2 TOP: Algebra and Number KEY: Conceptual Understanding
26. ANS: B PTS: 1 DIF: Moderate REF: 4.3 Mixed and Entire Radicals
LOC: 10.AN2 TOP: Algebra and Number KEY: Conceptual Understanding
27. ANS: B PTS: 1 DIF: Easy
REF: 4.4 Fractional Exponents and Radicals LOC: 10.AN3
TOP: Algebra and Number KEY: Conceptual Understanding
28. ANS: A PTS: 1 DIF: Easy REF: 4.6 Applying the Exponent Laws
LOC: 10.AN3 TOP: Algebra and Number KEY: Conceptual Understanding
29. ANS: A PTS: 1 DIF: Moderate REF: 4.6 Applying the Exponent Laws
LOC: 10.AN3 TOP: Algebra and Number KEY: Conceptual Understanding
30. ANS: B PTS: 1 DIF: Moderate REF: 4.6 Applying the Exponent Laws
LOC: 10.AN3 TOP: Algebra and Number KEY: Conceptual Understanding
31. ANS: B PTS: 1 DIF: Moderate REF: 4.6 Applying the Exponent Laws
LOC: 10.AN3 TOP: Algebra and Number KEY: Conceptual Understanding