Unit I: Measurement

Conversions/Formula

1 ft. = 12 in	1 in. = 2.54 cm	$S.A._{cylinder} = 2\pi r^2 + 2\pi rh$	$V_{pyramid} = \frac{1}{3}$(area of base)(height)
1 yd. = 3 ft.	1 mi. = 1.6 km	$S.A._{cone} = \pi rs + \pi r^2$	$V_{cone} = \frac{1}{3}\pi r^2 h$
1 mi. = 1760 yd.		$S.A._{sphere} = 4\pi r^2$	$V_{sphere} = \frac{4}{3}\pi r^3$

1. Which of the following calculations converts 4 yards into centimeters?

(A) $4 \text{ yd.} \times \frac{2.54\ cm}{1\ in.}$

(B) $4 \text{ yd.} \times \frac{3\ ft.}{1\ yd.} \times \frac{2.54\ cm}{1\ ft.}$

(C) $4 \text{ yd.} \times \frac{3\ ft.}{1\ yd.} \times \frac{12\ in.}{1\ ft.} \times \frac{2.54\ cm}{1\ in.}$

(D) $4 \text{ yd.} \times \frac{1\ ft.}{3\ yd.} \times \frac{1\ in.}{12\ ft.} \times \frac{1\ cm}{2.54\ in.}$

2. Tyler's driver's license states that he is 175 cm tall. What is his approximate height in feet and inches?

(A) 5 feet 5 inches (B) 5 feet 6 inches

(C) 5 feet 9 inches (D) 5 feet 10 inches

3. On a road trip in Florida, Brady sees a road sign that tells him he is 42 miles from Disney. What is that distance in kilometers?

(A) 26.25 km (B) 42 km (C) 43.6 km (D) 67.2 km

4. A cone and a cylinder have the same height and the same base radius. If volume of the cone is 48 cm^3, what is the volume of the cylinder in cm^3?

(A) 16 cm^3 (B) 24 cm^3 (C) 45 cm^3 (D) 144 cm^3

5. A square pyramid has a base length of 4 m and has a volume of 80 m^3, what is the height?

(A) 4 m (B) 5 m (C) 15 m (D) 16 m

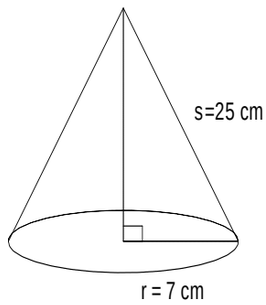
6. A cone has a radius of 7 cm and a slant height of 25 cm. What is its surface area (including the base), to the nearest square centimetre?

(A) 154 cm^2

(B) 593 cm^2

(C) 704 cm^2

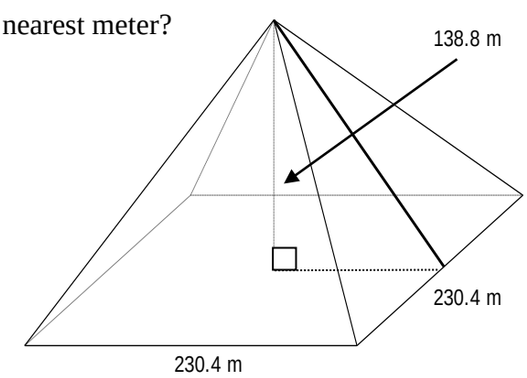
(D) 1033 cm^2



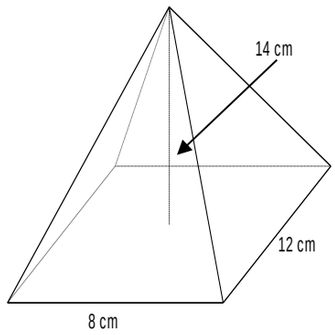
7. What is the slant height of the pyramid below to the nearest meter?

(A) 77 m (B) 180 m

(C) 254 m (D) 269 m



8. What is the volume of the rectangular pyramid below ?



(A) 432 cm^3 (B) 448 cm^3

(C) 656 cm^3 (D) 1344 cm^3

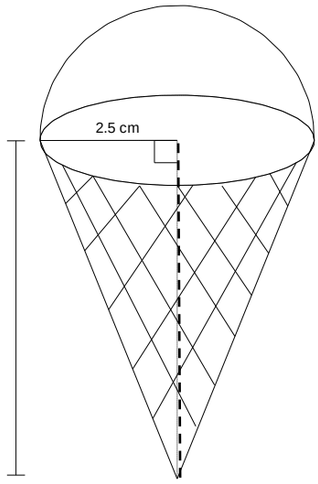
9. Jack is installing trim around a window that measures 52 in. by 48 in.

(A) If the trim is only sold by the foot, how many feet of trim will Jack need to buy?

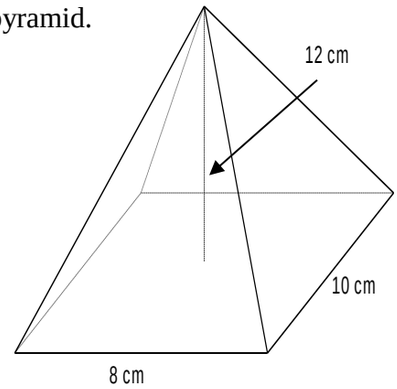
(B) If the trim costs $1.89 per foot, how much will it cost?

10. A bowling ball has a surface area of 615.44 cm^2. Determine the radius of the bowling ball to the nearest centimeter.

11. A picture of an ice cream cone is shown to the right. Ice cream fills the entire cone. How much ice cream is there in total to the nearest tenth of a cm^3 ?



12. Determine the surface area of the right rectangular pyramid.



Unit II: Roots and Powers

13. Simplify: $\sqrt{72}$

A) $2\sqrt{6}$ B) $6\sqrt{2}$ C) $18\sqrt{2}$ D) $36\sqrt{2}$

14. What is the LCM of 18 and 24 ?

(A) 2×3 (B) $2^2 \times 3^3$ (C) $2^3 \times 3^2$ (D) $2^4 \times 3^3$

15. What is the prime factorization of 630?

(A) $2 \cdot 5 \cdot 7 \cdot 9$ (B) $2 \cdot 5 \cdot 63$

(C) $2 \cdot 3^2 \cdot 5 \cdot 7$ (D) $2 \cdot 3 \cdot 5 \cdot 7$

16. What is the greatest common factor of 280 and 360?

(A) 9 (B) 40 (C) 63 (D) 2520

17. Which of the following is a perfect cube?

(A) $\sqrt[3]{225}$ (B) $\sqrt[3]{1728}$ (C) $\sqrt[3]{1296}$ (D) $\sqrt[3]{2000}$

18. What is the most simplified form of $\sqrt[4]{96}$?

(A) $2\sqrt[4]{6}$ (B) $4\sqrt[4]{6}$ (C) $4\sqrt[4]{24}$ (D) $16\sqrt[4]{6}$

19. Which of the following powers below represents the radical $\sqrt[3]{7^5}$?

(A) $7^{\frac{3}{5}}$ (B) $7^{\frac{5}{3}}$ (C) 7^2 (D) 7^{15}

20. Evaluate: $32^{-\frac{4}{5}}$

(A) –16 (B) $-\frac{1}{16}$ (C) $\frac{1}{16}$ (D) 16

21. Simplify: $(3x^{-1})^2(2x^2)^3$

(A) $72x^6$ (B) $36x^6$ (C) $72x^4$ (D) $6x^4$

22. Express $4\sqrt[3]{5}$ as an entire radical.

(A) $\sqrt[3]{9}$ (B) $\sqrt[3]{20}$ (C) $\sqrt[3]{60}$ (D) $\sqrt[3]{320}$

23. The surface area of a cube is 48 cm^2, what is the volume of the cube, in cm^3, in its most simplified form?

(A) $16\sqrt{2}$ (B) $\sqrt{512}$ (C) 512 (D) 110 592

24. Which is an **IRRATIONAL** number?

(A) $\sqrt[3]{2.744}$ (B) $\sqrt[4]{0.6561}$ (C) $\sqrt{729}$ (D) $\sqrt[4]{5973}$

25. Simplify $\frac{24p^4q^{-3}}{36pq^{-1}}$ using powers with positive exponents

(A) $\frac{2p^3q^2}{3}$ (B) $\frac{2p^3}{3q^2}$ (C) $\frac{2p^5}{3q^2}$ (D) $\frac{2p^4}{3q^3}$

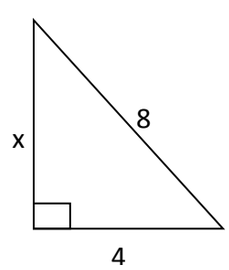
26. Simplify: $(-4x^2)^{-2}$

(A) $\frac{8}{x^4}$ (B) $-\frac{1}{16x^4}$ (C) $-\frac{4}{x^4}$ (D) $\frac{1}{16x^4}$

27. Simplify: $(27x^9y^{-6})^{\frac{2}{3}}$

(A) $\frac{9x^6}{y^4}$ (B) $\frac{6x^6}{y^4}$ (C) $\frac{81x^9}{y^6}$ (D) $\frac{3x^9}{y^6}$

28. Using the Pythagorean theorem, determine the value of x. Express the answer in simplest radical form.



29. Simplify the following expressions. Express the answer with positive exponents.

(a) $\left(2x^{-1}y^{-2}\right)^{-3}\left(4x^{6}y^{-4}\right)^{2}$ (b) $\dfrac{(2x)^{2}\left(3x^{2}y^{3}\right)^{3}}{6xy^{10}}$

(c) $\left(\dfrac{x^{\frac{-1}{4}}y^{\frac{3}{4}}}{x^{\frac{3}{4}}y^{\frac{-1}{4}}}\right)^{-4}$ (d) $\left(\dfrac{-27a^{9}b^{6}c^{9}}{8a^{12}b^{9}c^{6}}\right)^{\frac{2}{3}}$

Unit III: Factoring

30. What is the greatest common factor of the terms $4p^3q^3$, $6p^2q^2$, $12pq^2$?

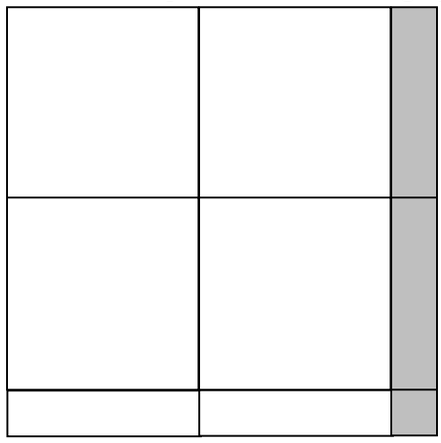
(A) $4pq^2$ (B) $4pq$ (C) $2pq^2$ (D) $2pq$

31. What are the correct factors of $x^2 - 3x - 18$?

(A) $(x + 6)(x - 3)$ (B) $(x + 3)(x - 6)$

(C) $(x - 6)(x - 3)$ (D) $(x - 9)(x + 2)$

32. Which factors are represented by the algebra tiles?
white tiles: positive grey tiles: negative



(A) $(2x - 1)(2x + 1)$

(B) $(2x - 2)(2x + 2)$

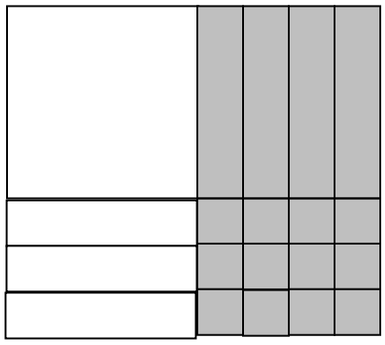
(C) $(4x - 1)(4x + 1)$

(D) $(4x - 2)(4x + 2)$

33. Simplify: $(3r - 2)^2$

(A) $9r^2 + 4$ (B) $9r^2 - 12r + 4$ (C) $9r^2 - 4$ (D) $9r^2 - 12r - 4$

34. Which expression is represented by the algebra tiles given below ?
white tiles: positive grey tiles: negative



(A) $x^2 - 7x - 12$

(B) $x^2 + 7x - 12$

(C) $x^2 - x - 12$

(D) $x^2 + x - 12$

35. What value represents ☐ in the expansion $(w - 8)(w - 3) = w^2 +$ ☐$w + 24$?

(A) -11 (B) 11 (C) -5 (D) 5

36. What are the correct factors of $8 + 2x - x^2$?

(A) $(2 - x)(4 - x)$ (B) $(2 + x)(4 + x)$

(C) $(2 - x)(4 + x)$ (D) $(2 + x)(4 - x)$

37. Which is the complete factored form of $4x^2 - 9$?

(A) $4(x + 3)(x - 3)$ (B) $(2x + 3)(2x + 3)$

(C) $(2x - 3)(2x + 3)$ (D) $(2x - 3)(2x - 3)$

38. Which represents a perfect square trinomial?

(A) $4x^2 + 10x + 25$ (B) $9x^2 + 24x + 16$
(C) $36 - 9x + x^2$ (D) $x^2 + xy + y^2$

39. Factor completely each of the following algebraic expressions.

(a) $m^2 - 11m + 24$ (b) $40 - 3y - y^2$

(c) $2m^2 + 16m + 30$ (d) $3p^2 + 2p - 8$

(e) $15x^2 - 39x - 18$ (f) $16x^2 - 40x + 25$

(g) $81y^2 - 16$ (h) $-18 + 98x^2$

(i) $36p^2 - 70pq + 25q^2$ (j) $12x^3 + 60x^2 + 75x$

Answers:

1. C 2. C 3.D 4. D 5.C 6. C 7.B 8.B

9.(a) 17 ft. (b) \$32.13 10. 7 cm 11. 81.8 cm^3 12. 310 cm^2

13. B 14. C 15. C 16. B 17. B 18. A 19. B 20. C 21. C 22. D 23. A
24. D 25. B 26. D 27. A

28. $4\sqrt{3}$ 29. (a) $\frac{2x^{15}}{y^2}$ (b) $\frac{18x^7}{y}$ (c) $\frac{x^4}{y^4}$ (d) $\frac{9c^2}{4a^2b^2}$

30. C 31. B 32. A 33. B 34. C 35. A 36.D 37. C 38. B

39.(a) $(m - 3)(m - 11)$ (b) $(5 - y)(8 + y)$ (c) $2(m + 5)(m + 3)$
(d) $(3p - 4)(p + 2)$ (e) $3(5x + 2)(x - 3)$ (f) $(4x - 5)^2$
(g) $(9y - 4)(9y + 4)$ (h) $-2(3 + 7x)(3 - 7x)$ (i) $(6p - 5q)^2$
(j) $3x(2x + 5)^2$