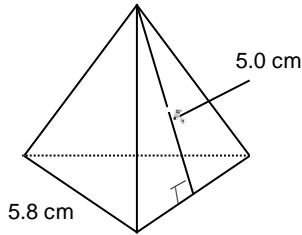


exam 1201 exam 1-cp2

Multiple Choice

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

- ___ 1. Convert 24 yd. to feet.
a. 288 ft. b. 72 ft. c. 2 ft. d. 8 ft.
- ___ 2. Convert 12 565 ft. to miles, yards, and feet.
a. 6 mi. 167 yd. 1 ft. c. 2 mi. 668 yd. 1 ft.
b. 2 mi. 55 yd. 25 ft. d. 6 mi. 668 yd. 1 ft.
- ___ 3. Marie has 17 yd. of material that she will cut into strips 19 in. wide. How many strips can Marie make?
a. 32 b. 21 c. 2 d. 10
- ___ 4. A 3-D puzzle of the CN Tower has a scale of 1:640. In the puzzle, the tower is $34\frac{1}{32}$ in. tall. What is the height of the CN Tower to the nearest foot?
a. 1833 ft. b. 605 ft. c. 1815 ft. d. 7260 ft.
- ___ 5. On a jigsaw puzzle, the length of the William R. Bennett Bridge is $27\frac{1}{2}$ in. The actual length of the bridge is 764 yd. What is the scale of the puzzle, to the nearest thousand?
a. 1:1302 b. 1:1000 c. 1:1100 d. 1:3333
- ___ 6. Which referent could you use for 1 m?
a. The width of a computer keyboard
b. The length of a dinner fork
c. The length of your stride
d. The width of a classroom in your school
- ___ 7. Which referent could you use for 1 mm?
a. The width of the head of an ant
b. The diameter of a beach ball
c. The distance between British Columbia and Manitoba
d. The length of a sheet of loose-leaf paper
- ___ 8. Which imperial unit is most appropriate for measuring the length of a ladder?
a. Feet b. Yards c. Miles d. Inches
- ___ 9. An indoor lacrosse goal is 4 ft. high. What is this measurement to the nearest tenth of a metre?
a. 1.3 m b. 1.2 m c. 13.3 m d. 12.0 m
- ___ 10. Convert 165 cm to feet and the nearest inch.
a. 5 ft. 8 in. b. 6 ft. 6 in. c. 5 ft. 4 in. d. 5 ft. 6 in.
- ___ 11. A thin strip of wood laminate is to be glued to the edges of a table. The length of laminate required is equal to the perimeter of the table, which has dimensions 175 cm by 110 cm. The laminate is sold in 8-ft. lengths. How much laminate must be purchased?
a. 24 ft. b. 32 ft. c. 16 ft. d. 8 ft.
- ___ 12. Determine the surface area of this regular tetrahedron to the nearest square centimetre.



- a. 29 cm^2 b. 116 cm^2 c. 58 cm^2 d. 44 cm^2

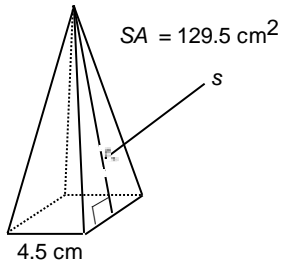
___ 13. The lateral area of a cone is 198.6 cm^2 . The diameter of the cone is 10.2 cm . Determine the height of the cone to the nearest tenth of a centimetre.

- a. 8.8 cm b. 11.3 cm c. 8.0 cm d. 12.4 cm

___ 14. A right pyramid has a square base with side length 12 m and a height of 7 m . Calculate the surface area of the pyramid to the nearest square metre.

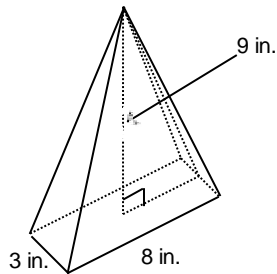
- a. 312 m^2 b. 443 m^2 c. 664 m^2 d. 365 m^2

___ 15. Calculate the slant height, s , of this right square pyramid to the nearest tenth of a centimetre.



- a. 11.9 cm b. 6.1 cm c. 12.1 cm d. 16.6 cm

___ 16. Calculate the volume of this right rectangular pyramid to the nearest cubic inch.

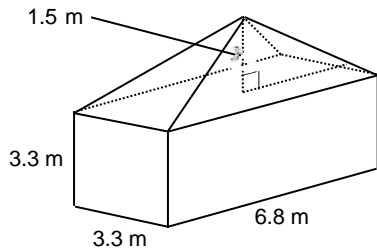


- a. 216 cubic inches b. 72 cubic inches c. 64 cubic inches d. 78 cubic inches

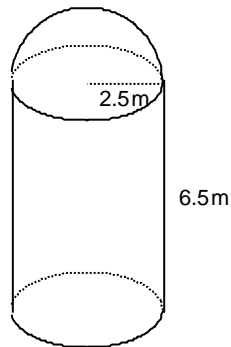
___ 17. A right rectangular prism with base dimensions 7.8 m by 5.1 m has a volume of 110.1 m^3 . Determine the height of the prism to the nearest tenth of a metre.

- a. 2.8 m b. 8.3 m c. 1.2 m d. 5.5 m

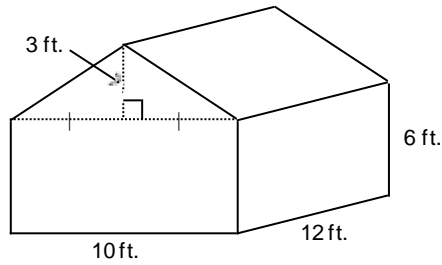
- ___ 18. The radius of a volleyball is approximately 11 cm. Determine the surface area of a volleyball to the nearest square centimetre.
 a. 6082 cm^2 b. 1521 cm^2 c. 380 cm^2 d. 5575 cm^2
- ___ 19. Mars approximates a sphere with radius 2100 mi. What is the approximate volume of Mars?
 a. $3.1 \times 10^{11} \text{ mi.}^3$ b. $3.9 \times 10^{10} \text{ mi.}^3$ c. $5.5 \times 10^7 \text{ mi.}^3$ d. $6.8 \times 10^{11} \text{ mi.}^3$
- ___ 20. A sphere has a surface area of 6.4 m^2 . What is the diameter of the sphere to the nearest tenth of a metre?
 a. 1.4 m b. 2.0 m c. 2.3 m d. 0.7 m
- ___ 21. A china bowl approximates a hemisphere with diameter 27.0 cm. What is the capacity of the bowl to the nearest tenth of a litre? ($1000 \text{ cm}^3 = 1\text{L}$)
 a. 5.2 L b. 10.3 L c. 0.4 L d. 2.6 L
- ___ 22. Determine the volume of this composite object, which is a right square prism and a right rectangular pyramid, to the nearest tenth of a cubic metre.



- a. 85.3 m^3 b. 107.7 m^3 c. 90.7 m^3 d. 514.8 m^3
- ___ 23. Determine the surface area of this composite object, which is a right cylinder and a hemisphere, to the nearest tenth of a square metre.



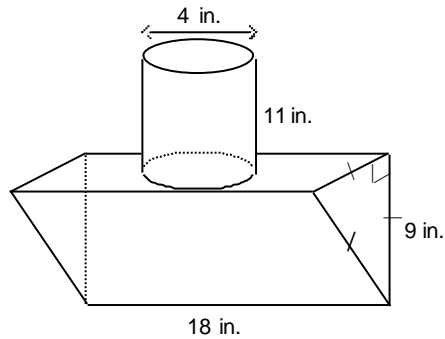
- a. 200.3 m^2 b. 180.6 m^2 c. 141.4 m^2 d. 161.0 m^2
- ___ 24. A garden shed is a composite object formed by a right rectangular prism with a right triangular prism as its roof. Determine the surface area of the garden shed to the nearest square foot.



- a. 366 square feet b. 554 square feet c. 434 square feet d. 464 square feet

Short Answer

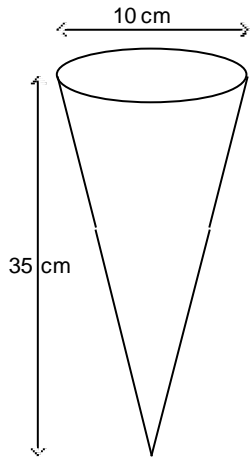
25. Determine the surface area of this composite object, which is a right triangular prism and a right cylinder, to the nearest square inch.



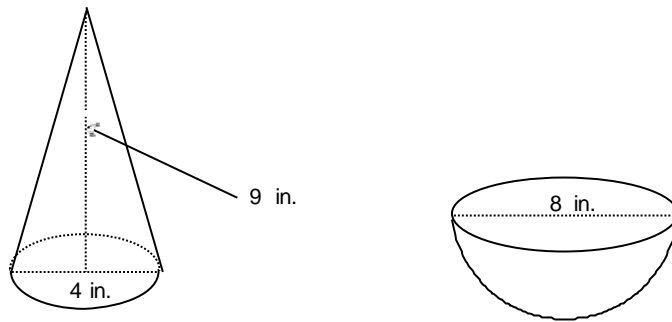
Problem

26. Convert 28 yd. to feet. Use unit analysis to verify the conversion.
27. In track and field, the 440-yd. race was replaced with the 400-m race when Canada changed from the imperial system to the SI system. Which race is longer and by how much? Use the exact conversion: 1 yd. = 91.44 cm
28. A right pyramid with a base that is a regular hexagon has a slant height of 5.0 m. The base area is 10.4 m^2 and the side length of the base is 2.0 m. Calculate the surface area of the pyramid to the nearest tenth of a square metre.
29. Three wooden blocks need to be painted. The first block is a right rectangular pyramid with base dimensions 1.5 cm by 2.5 cm and a height of 2.0 cm. The second block is a right square pyramid with a base length of 2.8 cm and a height of 2.0 cm. The third block is a right cone with a height of 2.0 cm and a base diameter of 3.6 cm. Which block requires the most paint? Which block requires the least paint? Sketch diagrams to help explain your answer.
30. A right square pyramid has base perimeter 62.4 m and height 6.4 m. Calculate the volume of the pyramid to the nearest cubic metre.

31. This cone was cut from a right rectangular prism with dimensions 19 cm by 21 cm by 65 cm. What volume of the right rectangular prism, in cubic centimetres, remains?



32. The base of this cone is to be glued to the circular face of the hemisphere. Calculate the surface area of the composite object formed, to the nearest square inch.



exam 1201 exam 1-cp2
Answer Section

MULTIPLE CHOICE

1. ANS: B PTS: 1 DIF: Easy REF: 1.1 Imperial Measures of Length
LOC: 10.M2 TOP: Measurement KEY: Procedural Knowledge
2. ANS: C PTS: 1 DIF: Easy REF: 1.1 Imperial Measures of Length
LOC: 10.M2 TOP: Measurement KEY: Procedural Knowledge
3. ANS: A PTS: 1 DIF: Moderate REF: 1.1 Imperial Measures of Length
LOC: 10.M2 TOP: Measurement KEY: Procedural Knowledge
4. ANS: C PTS: 1 DIF: Moderate REF: 1.1 Imperial Measures of Length
LOC: 10.M2 TOP: Measurement KEY: Procedural Knowledge
5. ANS: B PTS: 1 DIF: Difficult REF: 1.1 Imperial Measures of Length
LOC: 10.M2 TOP: Measurement KEY: Procedural Knowledge
6. ANS: C PTS: 1 DIF: Easy REF: 1.2 Measuring Length and Distance
LOC: 10.M1 TOP: Measurement KEY: Conceptual Understanding
7. ANS: A PTS: 1 DIF: Easy REF: 1.2 Measuring Length and Distance
LOC: 10.M1 TOP: Measurement KEY: Conceptual Understanding
8. ANS: A PTS: 1 DIF: Easy REF: 1.2 Measuring Length and Distance
LOC: 10.M1 TOP: Measurement KEY: Conceptual Understanding
9. ANS: B PTS: 1 DIF: Easy REF: 1.3 Relating SI and Imperial Units
LOC: 10.M2 TOP: Measurement KEY: Procedural Knowledge
10. ANS: D PTS: 1 DIF: Moderate REF: 1.3 Relating SI and Imperial Units
LOC: 10.M2 TOP: Measurement KEY: Procedural Knowledge
11. ANS: A PTS: 1 DIF: Difficult REF: 1.3 Relating SI and Imperial Units
LOC: 10.M2 TOP: Measurement KEY: Procedural Knowledge
12. ANS: C PTS: 1 DIF: Easy REF: 1.4 Surface Areas of Right Pyramids and Right Cones LOC: 10.M3
TOP: Measurement KEY: Procedural Knowledge
13. 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
14. 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
15. ANS: C PTS: 1 DIF: Difficult REF: 1.4 Surface Areas of Right Pyramids and Right Cones LOC: 10.M3
TOP: Measurement KEY: Procedural Knowledge
16. ANS: B PTS: 1 DIF: Easy REF: 1.5 Volumes of Right Pyramids and Right Cones LOC: 10.M3
TOP: Measurement KEY: Procedural Knowledge
17. ANS: A PTS: 1 DIF: Moderate REF: 1.5 Volumes of Right Pyramids and Right Cones LOC: 10.M3
TOP: Measurement KEY: Procedural Knowledge
18. ANS: B PTS: 1 DIF: Easy REF: 1.6 Surface Area and Volume of a Sphere LOC: 10.M3
TOP: Measurement KEY: Procedural Knowledge

19. ANS: B PTS: 1 DIF: Easy
REF: 1.6 Surface Area and Volume of a Sphere LOC: 10.M3
TOP: Measurement KEY: Procedural Knowledge
20. ANS: A PTS: 1 DIF: Moderate
REF: 1.6 Surface Area and Volume of a Sphere LOC: 10.M3
TOP: Measurement KEY: Procedural Knowledge
21. ANS: A PTS: 1 DIF: Moderate
REF: 1.6 Surface Area and Volume of a Sphere LOC: 10.M3
TOP: Measurement KEY: Procedural Knowledge
22. ANS: A PTS: 1 DIF: Easy
REF: 1.7 Solving Problems Involving Objects LOC: 10.M3
TOP: Measurement KEY: Procedural Knowledge
23. ANS: D PTS: 1 DIF: Easy
REF: 1.7 Solving Problems Involving Objects LOC: 10.M3
TOP: Measurement KEY: Procedural Knowledge
24. ANS: C PTS: 1 DIF: Moderate
REF: 1.7 Solving Problems Involving Objects LOC: 10.M3
TOP: Measurement KEY: Procedural Knowledge

SHORT ANSWER

25. ANS:
694 square inches

PTS: 1 DIF: Moderate REF: 1.7 Solving Problems Involving Objects
LOC: 10.M3 TOP: Measurement KEY: Problem-Solving Skills

PROBLEM

26. ANS:
Since 1 yd. = 3 ft., to convert yards to feet, multiply by 3.
28 yd. = 28(3 ft.)
28 yd. = 84 ft.

Write a conversion factor for yards and feet,
with feet in the numerator: $\frac{3 \text{ ft.}}{1 \text{ yd.}}$

$$\begin{aligned} \text{Then, } 28 \text{ yd.} \times \frac{3 \text{ ft.}}{1 \text{ yd.}} &= \frac{28 \text{ yd.}}{1} \times \frac{3 \text{ ft.}}{1 \text{ yd.}} \\ &= \frac{28 \text{ yd.}}{1} \times \frac{3 \text{ ft.}}{1 \text{ yd.}} \\ &= \frac{84 \text{ ft.}}{1} \\ &= 84 \text{ ft.} \end{aligned}$$

Since the measurements are equal, the conversion is verified.

PTS: 1 DIF: Moderate REF: 1.1 Imperial Measures of Length
LOC: 10.M2 TOP: Measurement KEY: Procedural Knowledge

27. ANS:

Convert 440 yd. to centimetres.

$$1 \text{ yd.} = 91.44 \text{ cm}$$

$$\text{So, } 440 \text{ yd.} = 440(91.44 \text{ cm})$$

$$440 \text{ yd.} = 40\,233.6 \text{ cm}$$

Convert 40 233.6 cm to metres.

$$1 \text{ m} = 100 \text{ cm}$$

$$\text{So, } 40\,233.6 \text{ cm} = \frac{40\,233.6}{100} \text{ m}$$

$$= 402.336 \text{ m}$$

Since $402.336 \text{ m} > 400 \text{ m}$, the 440-yd. race is longer.

$$402.336 \text{ m} - 400 \text{ m} = 2.336 \text{ m}$$

The 440-yd. race is longer than the 400-m race by approximately 2.3 m.

PTS: 1 DIF: Moderate REF: 1.3 Relating SI and Imperial Units
LOC: 10.M2 TOP: Measurement KEY: Problem-Solving Skills

28. ANS:

$$SA = \frac{1}{2}(\text{slant height})(\text{perimeter of base}) + (\text{base area})$$

$$SA = \left(\frac{1}{2}\right)(5.0)(6 \times 2.0) + 10.4$$

$$SA = \left(\frac{1}{2}\right)(5.0)(12.0) + 10.4$$

$$SA = 30.0 + 10.4$$

$$SA = 40.4$$

The surface area of the pyramid is 40.4 m^2 .

PTS: 1 DIF: Moderate REF: 1.4 Surface Areas of Right Pyramids and Right Cones
LOC: 10.M3 TOP: Measurement KEY: Problem-Solving Skills

29. ANS:

Surface area of right rectangular pyramid:

Sketch the pyramid and label its vertices.

In $\triangle EFH$, FH is $\frac{1}{2}$ the length of BC, so FH is 0.75 cm.

EF is the height of the pyramid, which is 2.0 cm.

Use the Pythagorean Theorem in right $\triangle EFH$.

$$EH^2 = EF^2 + FH^2$$

$$EH^2 = 2.0^2 + 0.75^2$$

$$EH^2 = 4.5625$$

$$EH = \sqrt{4.5625}$$

Area, A, of $\triangle EDC$ is:

$$A = \frac{1}{2}(2.5)(\sqrt{4.5625})$$

$$A = 1.25(\sqrt{4.5625})$$

Since $\triangle EDC$ and $\triangle EAB$ are congruent, the area of $\triangle EAB$ is $1.25(\sqrt{4.5625})$.

In $\triangle EFG$, FG is $\frac{1}{2}$ the length of DC, so FG is 1.25 cm.

Use the Pythagorean Theorem in right $\triangle EFG$.

$$EG^2 = EF^2 + FG^2$$

$$EG^2 = 2.0^2 + 1.25^2$$

$$EG^2 = 5.5625$$

$$EG = \sqrt{5.5625}$$

Area, A, of $\triangle EBC$ is:

$$A = \frac{1}{2}(1.5)(\sqrt{5.5625})$$

$$A = 0.75(\sqrt{5.5625})$$

Since $\triangle EBC$ and $\triangle EAD$ are congruent, the area of $\triangle EAD$ is $0.75(\sqrt{5.5625})$.

Area, B, of the base of the pyramid is:

$$B = (1.5)(2.5)$$

$$B = 3.75$$

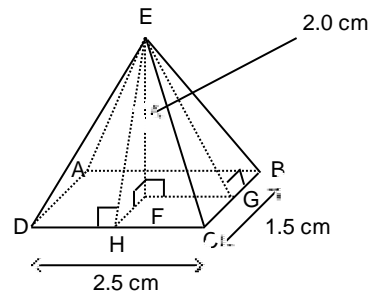
Each of two triangles has area $1.25(\sqrt{4.5625})$, and each of the other two triangles has area $0.75(\sqrt{5.5625})$.

Surface area, SA, of the right rectangular pyramid is:

$$SA = 2(1.25)(\sqrt{4.5625}) + 2(0.75)(\sqrt{5.5625}) + 3.75$$

$$SA = 12.6277 \dots$$

The surface area of the right rectangular pyramid is approximately 12.6 cm^2 .



Surface area of right square pyramid:
 Sketch the pyramid and label its vertices.

In $\triangle EFH$, FH is $\frac{1}{2}$ the length of BC, so FH is 1.4 cm.

Use the Pythagorean Theorem in right $\triangle EFH$ to find the slant height, s .

$$s^2 = EF^2 + FH^2$$

$$s^2 = 2.0^2 + 1.4^2$$

$$s^2 = 4.0 + 1.96$$

$$s^2 = 5.96$$

$$s = \sqrt{5.96}$$

Surface area, SA, of the right square pyramid is:

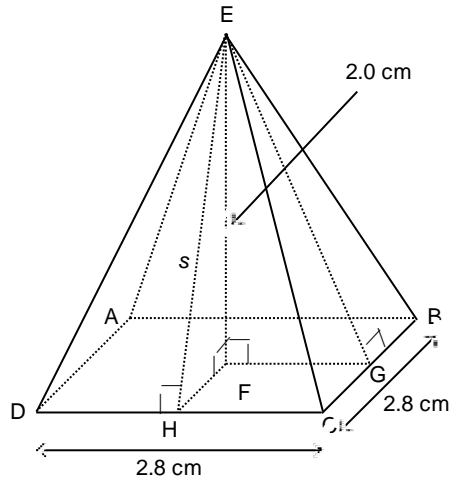
$$SA = \left(\frac{1}{2}\right)s(\text{perimeter of base}) + (\text{base area})$$

$$SA = \left(\frac{1}{2}\right)(\sqrt{5.96})(2.8 \times 4) + (2.8 \times 2.8)$$

$$SA = \left(\frac{1}{2}\right)(\sqrt{5.96})(11.2) + 7.84$$

$$SA = 21.5113\dots$$

The surface area of the right square pyramid is approximately 21.5 cm^2 .



Surface area of right cone:

Sketch a diagram.

In $\triangle ABC$, BC is $\frac{1}{2}$ the diameter of the cone,

so BC is 1.8 cm.

Use the Pythagorean Theorem to find the slant height, s .

$$s^2 = AC^2 + BC^2$$

$$s^2 = 2.0^2 + 1.8^2$$

$$s^2 = 4.0 + 3.24$$

$$s^2 = 7.24$$

$$s = \sqrt{7.24}$$

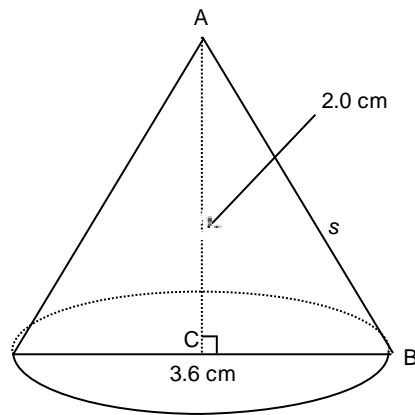
Surface area, SA, of the right cone is:

$$SA = \pi r s + \pi r^2$$

$$SA = \pi(1.8)(\sqrt{7.24}) + \pi(1.8)^2$$

$$SA = 25.3944\dots$$

The surface area of the right cone is approximately 25.4 cm^2 .



So, the block that is a right cone requires the most paint and the block that is a right rectangular pyramid requires the least paint.

Let s represent the slant height.

Use the Pythagorean Theorem in right $\triangle ADB$.

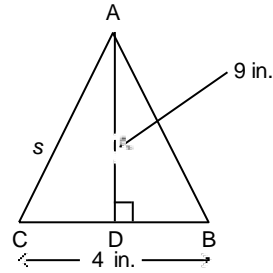
$$s^2 = AD^2 + BD^2$$

$$s^2 = 9^2 + 2^2$$

$$s^2 = 81 + 4$$

$$s^2 = 85$$

$$s = \sqrt{85}$$



The lateral area of the cone, in square inches, is:

$$SA = \pi r s$$

$$SA = \pi(2)(\sqrt{85})$$

$$SA = 57.9281\dots$$

Use the formula to find the surface area of the hemisphere.

The radius, r , is:

$$r = \frac{1}{2}(8 \text{ in.})$$

$$r = 4 \text{ in.}$$

$$SA = \frac{1}{2}(4\pi r^2) + \pi r^2$$

$$SA = 3\pi r^2$$

$$SA = 3\pi(4)^2$$

$$SA = 150.7964\dots$$

The area of the base of the cone, in square inches, is:

$$SA = \pi r^2$$

$$SA = \pi(2)^2$$

$$SA = 12.5663\dots$$

The surface area of the composite object is:

$$57.9281\dots + 150.7964\dots - 12.5663\dots = 196.1581\dots$$

The surface area of the composite object is approximately 196 square inches.

PTS: 1

DIF: Difficult

REF: 1.7 Solving Problems Involving Objects

LOC: 10.M3

TOP: Measurement

KEY: Problem-Solving Skills