A.CED.A.4: Transforming Formulas 3

1 If the product of x and $\dfrac{1}{m}$ is -1, $m \neq 0$, then x is equivalent to
   1) m
   2) $-m$
   3) $1-m$
   4) $-\dfrac{1}{m}$

2 If $bx - 2 = K$, then x equals
   1) $\dfrac{K}{b} + 2$
   2) $\dfrac{K-2}{b}$
   3) $\dfrac{2-K}{b}$
   4) $\dfrac{K+2}{b}$

3 If $x = 2a - b^2$, then a equals
   1) $\dfrac{x - b^2}{2}$
   2) $\dfrac{x + b^2}{2}$
   3) $\dfrac{b^2 - x}{2}$
   4) $x + b^2$

4 If $2m + 2p = 16$, p equals
   1) $8 - m$
   2) $16 - m$
   3) $16 + 2m$
   4) $9m$

5 In the equation $A = p + prt$, t is equivalent to
   1) $\dfrac{A - pr}{p}$
   2) $\dfrac{A - p}{pr}$
   3) $\dfrac{A}{pr} - p$
   4) $\dfrac{A}{p} - pr$

6 If $c = 2m + d$, then m is equal to
   1) $\dfrac{c - d}{2}$
   2) $\dfrac{c}{2} - d$
   3) $c - \dfrac{d}{2}$
   4) $d - 2c$

7 Sean knows the length of the base, b, and the area, A, of a triangular window in his bedroom. Which formula could he use to find the height, h, of this window?
   1) $h = 2A - b$
   2) $h = \dfrac{A}{2b}$
   3) $h = (2A)(b)$
   4) $h = \dfrac{2A}{b}$

8 The formula for the volume of a right circular cylinder is $V = \pi r^2 h$. The value of h can be expressed as
   1) $\dfrac{V}{\pi} r^2$
   2) $\dfrac{V}{\pi r^2}$
   3) $\dfrac{\pi r^2}{V}$
   4) $V - \pi r^2$

9 The formula for potential energy is $P = mgh$, where P is potential energy, m is mass, $\underline{g}$ is gravity, and h is height. Which expression can be used to represent g?
   1) $P - m - h$
   2) $P - mh$
   3) $\dfrac{P}{m} - h$
   4) $\dfrac{P}{mh}$

10 If $9x + 2a = 3a - 4x$, then x equals
  1) a
  2) $-a$
  3) $\dfrac{5a}{12}$
  4) $\dfrac{a}{13}$

11 If $x + y = 9x + y$, then x is equal to
  1) y
  2) $\dfrac{1}{5}y$
  3) 0
  4) 8

12 If $7x + 2a = 3x + 5a$, then x is equivalent to
  1) $\dfrac{7a}{10}$
  2) $\dfrac{7a}{4}$
  3) $\dfrac{3a}{10}$
  4) $\dfrac{3a}{4}$

13 If $2ax - 5x = 2$, then x is equivalent to
  1) $\dfrac{2 + 5a}{2a}$
  2) $\dfrac{1}{a - 5}$
  3) $\dfrac{2}{2a - 5}$
  4) $7 - 2a$

14 If $\dfrac{x}{4} - \dfrac{a}{b} = 0$, $b \neq 0$, then x is equal to
  1) $-\dfrac{a}{4b}$
  2) $\dfrac{a}{4b}$
  3) $-\dfrac{4a}{b}$
  4) $\dfrac{4a}{b}$

15 The equation $P = 2L + 2W$ is equivalent to
  1) $L = \dfrac{P - 2W}{2}$
  2) $L = \dfrac{P + 2W}{2}$
  3) $2L = \dfrac{P}{2W}$
  4) $L = P - W$

16 Which equation is equivalent to $3x + 4y = 15$?
  1) $y = \dfrac{15 - 3x}{4}$
  2) $y = \dfrac{3x - 15}{4}$
  3) $y = 15 - 3x$
  4) $y = 3x - 15$

17 Solve: $(a - x)(b - x) = x^2$

18 In physics class, Esther learned that force due to gravity can be determined by using the formula $F = \dfrac{Gm_1 m_2}{r^2}$. Solve for r in terms of F, G, m_1, and m_2.

19 Shoe sizes and foot length are related by the formula $S = 3F - 24$, where S represents the shoe size and F represents the length of the foot, in inches.
  a Solve the formula for F.
  b To the *nearest tenth of an inch,* how long is the foot of a person who wears a size $10\frac{1}{2}$ shoe?

20 The slant height, ℓ, of the conical water tank shown in the accompanying diagram is $\ell = \sqrt[3]{\dfrac{8v}{\pi}}$. Solve for v, in terms of ℓ and π.
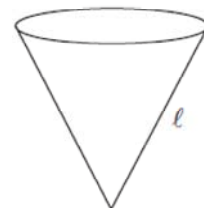
21 The volume of Earth can be calculated by using the formula $V = \dfrac{4}{3}\pi r^3$. Solve for r in terms of V.

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Answer Section

1 ANS: 2

$$x \times \frac{1}{m} = -1$$

$$\frac{x}{m} = -1$$

$$x = -m$$

REF: 060729a

2 ANS: 4

$$bx - 2 = K$$

$$bx = K + 2$$

$$x = \frac{K + 2}{b}$$

REF: 010116a

3 ANS: 2

$$x = 2a - b^2$$

$$x + b^2 = 2a$$

$$\frac{x + b^2}{2} = a$$

REF: 060219a

4 ANS: 1

$$2m + 2p = 16$$

$$2p = 16 - 2m$$

$$p = \frac{16 - 2m}{2}$$

$$p = \frac{2(8 - m)}{2}$$

$$p = 8 - m$$

REF: 080218a

5 ANS: 2

$$A = p + prt$$

$$A - p = prt$$

$$\frac{A - p}{pr} = t$$

REF: 010620a

6 ANS: 1

$$c = 2m + d$$
$$c - d = 2m$$
$$m = \frac{c - d}{2}$$

REF: 060719a

7 ANS: 4

$$A = \frac{1}{2}bh$$
$$2A = bh$$
$$h = \frac{2A}{b}$$

REF: 010517a

8 ANS: 2

$$V = \pi r^2 h$$
$$\frac{V}{\pi r^2} = v$$

REF: 060617a

9 ANS: 4

$$P = mgh$$
$$g = \frac{P}{mh}$$

REF: 010710a

10 ANS: 4

$$9x + 2a = 3a - 4x$$
$$a = 13x$$
$$\frac{a}{13} = x$$

REF: 010011a

11 ANS: 3

$$x + y = 9x + y$$
$$x = 9x$$
$$0 = 8x$$
$$x = 0$$

REF: 060310a

12 ANS: 4

$$7x + 2a = 3x + 5a$$
$$4x = 3a$$
$$x = \frac{3a}{4}$$

REF: 060513a

13 ANS: 3

$$2ax - 5x = 2$$
$$x(2a - 5) = 2$$
$$x = \frac{2}{2a - 5}$$

REF: 010421a

14 ANS: 4

$$\frac{x}{4} - \frac{a}{b} = 0$$
$$\frac{x}{4} = \frac{a}{b}$$
$$bx = 4a$$
$$x = \frac{4a}{b}$$

REF: 080530a

15 ANS: 1

$$P = 2L + 2W$$
$$P - 2W = 2L$$
$$\frac{P - 2W}{2} = L$$

REF: 010310a

16 ANS: 1

$$3x + 4y = 15$$
$$4y = 15 - 3x$$
$$y = \frac{15 - 3x}{4}$$

REF: 080722a

17 ANS:

$$\frac{a^2}{a + b}$$

REF: 039008al

18 ANS:

$$F = \frac{Gm_1m_2}{r^2}$$

$$r = \sqrt{\frac{Gm_1m_2}{F}} \; . \quad r^2 = \frac{Gm_1m_2}{F}$$

$$r = \sqrt{\frac{Gm_1m_2}{F}}$$

REF: 080924b

19 ANS:

$$S = 3F - 24$$

$$\frac{S+24}{3}, 11.5. \quad S + 24 = 3F \qquad . \quad F = \frac{(10.5) + 24}{3} = 11.5$$

$$F = \frac{S+24}{3}$$

REF: 069922a

20 ANS:

$$\ell = \sqrt[3]{\frac{8v}{\pi}}$$

$$v = \frac{\pi\ell^3}{8} . \quad \ell^3 = \frac{8v}{\pi}$$

$$v = \frac{\pi\ell^3}{8}$$

REF: 080725b

21 ANS:

$$V = \frac{4}{3}\pi r^3$$

$$r = \sqrt[3]{\frac{3V}{4\pi}} \; . \quad r^3 = \frac{3V}{4\pi}$$

$$r = \sqrt[3]{\frac{3V}{4\pi}}$$

REF: 010926b