

**A.CED.A.4: Transforming Formulas 3b**

- 1 If the product of  $x$  and  $\frac{1}{m}$  is  $-1$ ,  $m \neq 0$ , then  $x$  is equivalent to
- 2 If  $bx - 2 = K$ , then  $x$  equals
- 3 If  $x = 2a - b^2$ , then  $a$  equals
- 4 If  $2m + 2p = 16$ ,  $p$  equals
- 5 In the equation  $A = p + prt$ ,  $t$  is equivalent to
- 6 If  $c = 2m + d$ , then  $m$  is equal to
- 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?
- 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
- 9 The formula for potential energy is  $P = mgh$ , where  $P$  is potential energy,  $m$  is mass,  $g$  is gravity, and  $h$  is height. Which expression can be used to represent  $g$ ?
- 10 If  $9x + 2a = 3a - 4x$ , then  $x$  equals
- 11 If  $x + y = 9x + y$ , then  $x$  is equal to
- 12 If  $7x + 2a = 3x + 5a$ , then  $x$  is equivalent to
- 13 If  $2ax - 5x = 2$ , then  $x$  is equivalent to
- 14 If  $\frac{x}{4} - \frac{a}{b} = 0$ ,  $b \neq 0$ , then  $x$  is equal to
- 15 The equation  $P = 2L + 2W$  is equivalent to
  - 1)  $L = \frac{P - 2W}{2}$
  - 2)  $L = \frac{P + 2W}{2}$
  - 3)  $2L = \frac{P}{2W}$
  - 4)  $L = P - W$

16 Which equation is equivalent to  $3x + 4y = 15$ ?

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

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

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

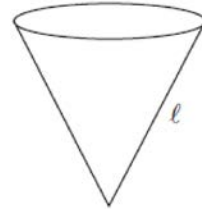
$F = \frac{Gm_1m_2}{r^2}$ . Solve for  $r$  in terms of  $F$ ,  $G$ ,  $m_1$ , and  $m_2$ .

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,  $\ell$ , of the conical water tank shown in the accompanying diagram is  $\ell = \sqrt[3]{\frac{8v}{\pi}}$ . Solve for  $v$ , in terms of  $\ell$  and  $\pi$ .



21 The volume of Earth can be calculated by using the formula  $V = \frac{4}{3}\pi r^3$ . Solve for  $r$  in terms of  $V$ .

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#### Answer Section

1 ANS:

$$-m$$

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

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

$$x = -m$$

REF: 060729a

2 ANS:

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

$$bx - 2 = K$$

$$bx = K + 2$$

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

REF: 010116a

3 ANS:

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

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

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

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

REF: 060219a

4 ANS:

$$8 - m$$

$$2m + 2p = 16$$

$$2p = 16 - 2m$$

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

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

$$p = 8 - m$$

REF: 080218a

5 ANS:

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

$$A = p + prt$$

$$A - p = prt$$

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

REF: 010620a

6 ANS:

$$\frac{c-d}{2}$$

$$c = 2m + d$$

$$c - d = 2m$$

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

REF: 060719a

7 ANS:

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

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

$$2A = bh$$

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

REF: 010517a

8 ANS:

$$\frac{V}{\pi r^2}$$

$$V = \pi r^2 h$$

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

REF: 060617a

9 ANS:

$$\frac{P}{mh}$$

$$P = mgh$$

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

REF: 010710a

10 ANS:

$$\frac{a}{13}$$

$$9x + 2a = 3a - 4x$$

$$a = 13x$$

$$\frac{a}{13} = x$$

REF: 010011a

11 ANS:

$$0$$

$$x + y = 9x + y$$

$$x = 9x$$

$$0 = 8x$$

$$x = 0$$

REF: 060310a

12 ANS:

$$\frac{3a}{4}$$

$$7x + 2a = 3x + 5a$$

$$4x = 3a$$

$$x = \frac{3a}{4}$$

REF: 060513a

13 ANS:

$$\frac{2}{2a-5}$$

$$2ax - 5x = 2$$

$$x(2a - 5) = 2$$

$$x = \frac{2}{2a - 5}$$

REF: 010421a

14 ANS:

$$\frac{4a}{b}$$

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

$$\frac{x}{4} = \frac{a}{b}$$

$$bx = 4a$$

$$x = \frac{4a}{b}$$

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:

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

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

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

REF: 080924b

19 ANS:

$$S = 3F - 24$$

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

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

REF: 069922a

20 ANS:

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

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

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

REF: 080725b

21 ANS:

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

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

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

REF: 010926b