TSI 35 STEP
11-02-17

TSI 35 Multiple Choice

1. Find C if $C = P + 0.05P$ and $P = 30$

   (a) $C = 40.60$ (b) $C = 43.50$

   (c) $C = 31.50$ (d) $C = 33.50$

2. Find $h(2)$ if $h(x) = -16x^2 + 32x$

   (a) $h(2) = 32$ (b) $h(2) = 12$

   (c) $h(2) = 0$ (d) $h(2) = 10$

3. Find y if $y = 31.95x + 0.10m$, $x = 5$, and $m = 200$

   (a) $y = 199.55$ (b) $y = 166.55$

   (c) $y = 179.75$ (d) $y = 189.75$

4. Find $g(2)$ if $g(x) = \dfrac{x}{1-x}$

   (a) $g(2) = 0$ (b) $g(2) = -4$

   (c) $g(2) = -2$ (d) $g(2) = 2$

5. Find $f(-3)$ if $f(x) = |x - 2|$

   (a) $f(-3) = 9$ (b) $f(-3) = 0$

   (c) $f(-3) = 5$ (d) $f(-3) = 8$

6. Find $f(-1)$ if $f(x) = 4x^2$

   (a) $f(-1) = -1$ (b) $f(-1) = -4$

   (c) $f(-1) = 4$ (d) $f(-1) = 8$

7. Find $f(-1)$ if $f(x) = \dfrac{x-1}{x^2-9}$

   (a) $f(-1) = -4$ (b) $f(-1) = 3$

   (c) $f(-1) = \dfrac{1}{4}$ (d) $f(-1) = \dfrac{1}{3}$

8. Find $f(1)$ if $f(x) = (x-1)^2 + 8$

   (a) $f(1) = 4$ (b) $f(1) = 12$

   (c) $f(1) = 8$ (d) $f(1) = 10$

9. Find $x - y$ if $x = \dfrac{1}{4}$ and $y = -x$

   (a) $\dfrac{1}{3}$ (b) $-\dfrac{1}{3}$

   (c) $\dfrac{1}{2}$ (d) $-\dfrac{1}{2}$

10. Solve $4x + 1 = 10$

(a) $x = -\frac{9}{4}$

(b) $x = \frac{1}{4}$

(c) $x = \frac{9}{4}$

(d) $x = \frac{3}{4}$

11. Solve $\frac{3}{2}x + 1 = 5$

(a) $x = \frac{5}{3}$

(b) $x = \frac{2}{3}$

(c) $x = \frac{8}{3}$

(d) $x = \frac{1}{3}$

12. If $2x + 1 = 4$, find $12x$

(a) 10

(b) 12

(c) 18

(d) 16

13. Solve $5x = 12 + 2x$

(a) $x = 1$

(b) $x = 2$

(c) $x = 4$

(d) $x = 9$

14. Solve $3x = 2(x + 8)$

(a) $x = 2$

(b) $x = 18$

(c) $x = 16$

(d) $x = 17$

15. If $2x + 1 = 4$, find $x + 2$

(a) 2

(b) 3

(c) $\frac{7}{2}$

(d) $\frac{3}{2}$

16. If $4x - 1 = x$, find $30x$

(a) 40

(b) 12

(c) 10

(d) 11

17. Solve $-2x < 8$

(a) $x > 4$

(b) $x < 4$

(c) $x > -4$

(d) $x < -4$

18. Solve $2x < -6$

(a) $x > 2$

(b) $x < 2$

(c) $x < -3$

(d) $x > -3$

19. If $xy = k$ and $x = 2$ when $y = 10$, then find x when $y = 5$

(a) $x = 3$ (b) $x = 1$

(c) $x = 4$ (d) $x = 2$

20. Simplify $(3x - 2)(x + 5)$

(a) $3x^2 + 13x + 10$ (b) $3x^2 - 13x - 10$

(c) $3x^2 + 13x - 10$ (d) $3x^2 - 13x + 10$

21. $(2xy^4)^2$

(a) $8x^2y^6$ (b) $16x^2y^8$

(c) $4x^2y^8$ (d) $2xy^8$

22. $(3 + ax)(2x - 1)$

(a) $-6x + 3 + 2ax^2 + ax$ (b) $6x + 3 + 2ax^2 + ax$

(c) $6x - 3 + 2ax^2 - ax$ (d) $6x - 3 - 2ax^2 - ax$

23. Find C if $(3x - 2)(4x + C) = 12x^2 + 7x - 10$

(a) $C = 8$ (b) $C = 7$

(c) $C = 5$ (d) $C = 6$

24. Factor GCF $4x^3y - 2x^2y^2$

(a) $2x^2y^3(2x - y)$ (b) $2xy(2x + y)$

(c) $2x^2y(2x - y)$ (d) $2x^2y(2x + y)$

25. Factor GCF $4y - 2$

(a) $2(2y + 11)$ (b) $2(2y + 3)$

(c) $2(2y - 1)$ (d) $2(2y + 1)$

26. Factor $\frac{x^2}{9} - 64$

(a) $(3x + 8)(3x - 8)$ (b) $\left(\frac{x}{3} + 8\right)\left(\frac{x}{3} + 8\right)$

(c) $\left(\frac{x}{3} + 8\right)\left(\frac{x}{3} - 8\right)$ (d) $\left(\frac{x}{3} - 8\right)\left(\frac{x}{3} - 8\right)$

27. Factor GCF $8x^3 + 14x^2 + 12xy$

(a) $2x(4x^2 - 7x - 6y)$ (b) $2x(4x^2 + 11x + 6y)$

(c) $2x(4x^2 + 7x + 6y)$ (d) $2x(4x^2 + 3x + y)$

28. Simplify $\dfrac{5xy+y}{y}$

(a) $2x+1$ (b) $3x+1$

(c) $5x+1$ (d) $5x-1$

29. Simplify $\dfrac{8n+4}{4}$

(a) $2n+5$ (b) $3n+1$

(c) $2n+1$ (d) $2n-1$

30. Solve $2x(x+5)=0$

(a) $\{-2,5\}$ (b) $\{2,5\}$

(c) $\{0,-5\}$ (d) $\{0,5\}$

31. Solve $2x^2+5x-12=0$

(a) $\left\{-\frac{7}{2},-4\right\}$ (b) $\left\{\frac{1}{2},4\right\}$

(c) $\left\{\frac{3}{2},-4\right\}$ (d) $\left\{-\frac{3}{2},-4\right\}$

32. Solve $3x^2+13x=10$

(a) $\{-3,5\}$ (b) $\left\{\frac{2}{3},5\right\}$

(c) $\left\{\frac{2}{3},-5\right\}$ (d) $\left\{-\frac{2}{3},-5\right\}$

33. Solve $2x^2=-7x-3$

(a) $\{-2,-3\}$ (b) $\left\{\frac{1}{2},3\right\}$

(c) $\left\{-\frac{1}{2},-3\right\}$ (d) $\left\{-\frac{1}{2},3\right\}$

34. Solve $8x^2-1=7x$

(a) $\left\{\frac{7}{8},1\right\}$ (b) $\{-8,1\}$

(c) $\left\{-\frac{1}{8},1\right\}$ (d) $\left\{-\frac{1}{8},-1\right\}$

35. Solve $x^2+8x+11=0$ (use Quadratic formula)

(a) $\{1,11\}$ (b) $\{-7-\sqrt{5},-7+\sqrt{5}\}$

(c) $\{-4-\sqrt{5},-4+\sqrt{5}\}$ (d) $\{-4-\sqrt{2},-4+\sqrt{2}\}$

1. Find C if $C = P + 0.05P$ and $P = 30$

$C = 30 + 0.05(30)$

$C = 30 + 1.50$

$C = 31.50$

(5)

2. Find $h(2)$ if $h(x) = -16x^2 + 32x$

$h(2) = -16(2)^2 + 32(2)$

$h(2) = -16(2)(2) + 32(2)$

$h(2) = -16(4) + 32(2)$

$h(2) = -64 + 64$

$h(2) = 0$

3. Find y if $y = 31.95x + 0.10m$, $x = 5$, $m = 200$

$y = 31.95(5) + 0.10(200)$

$y = 159.75 + 20$

$y = 179.75$

(4) Find $g(2)$ if $g(x) = \frac{x}{1-x}$

$$g(2) = \frac{2}{1-(2)}$$

$$g(2) = \frac{2}{1-2}$$

$$g(2) = \frac{2}{-1}$$

$$g(2) = -2$$

(6)

(5.) Find $f(-3)$ if $f(x) = |x-2|$

$$f(-3) = |-3-2|$$

$$f(-3) = |-5|$$

$$f(-3) = 5$$

(6.) Find $f(-1)$ if $f(x) = 4x^2$

$$f(-1) = 4(-1)^2$$

$$f(-1) = 4(-1)(-1)$$

$$f(-1) = 4(1)$$

$$f(-1) = 4$$

7. Find $f(-1)$ if $f(x) = \frac{x-1}{x^2-9}$

(7)

$$f(-1) = \frac{(-1)-1}{(-1)^2-9}$$

$$f(-1) = \frac{-1-1}{(-1)(-1)-9}$$

$$f(-1) = \frac{-2}{1-9}$$

$$f(-1) = \frac{-2}{-8}$$

$$f(-1) = \frac{-2(1)}{-2(4)}$$

$$f(-1) = \frac{1}{4}$$

8. Find $f(1)$ if $f(x) = (x-1)^2 + 8$

$$f(1) = (1-1)^2 + 8$$
$$f(1) = (0)^2 + 8$$
$$f(1) = (0)(0) + 8$$
$$f(1) = 0 + 8$$
$$f(1) = 8$$

9. Find $x-y$ if $x = \frac{1}{4}$ and $y = -x$

$x - y =$
$x - (-x) =$ Subst
$x + x =$
$1x + 1x =$
$2x$

$2\left(\frac{1}{4}\right) =$
$\frac{2}{1}\left(\frac{1}{4}\right) =$
$\frac{2}{4} =$
$\frac{2(1)}{2(2)} =$

$\frac{1}{2}$

10. Solve $4x+1=10$

$4x+1-1=10-1$

$4x=9$

$\frac{4x}{4}=\frac{9}{4}$

$x=\frac{9}{4}$

11. Solve $\frac{3}{2}x+1=5$

$\frac{3}{2}x+1-1=5-1$

$\frac{3x}{2}=4$

$\frac{3x}{2}=\frac{4}{1}$ rewrite

$1(3x)=2(4)$ cross multiply

$3x=8$

$\frac{3x}{3}=\frac{8}{3}$

$x=\frac{8}{3}$

12. If $2x+1=4$, find $12x$.

$2x+1-1=4-1$

$2x=3$

$\frac{2x}{2}=\frac{3}{2}$

$x=\frac{3}{2}$

$12\left(\frac{3}{2}\right)=$ subst

$\frac{12}{1}\left(\frac{3}{2}\right)=$

$\frac{36}{2}=$

$18=$

(13) Solve $5x = 12 + 2x$

$5x - 2x = 12 + 2x - 2x$

$3x = 12$

$\frac{3x}{3} = \frac{12}{3}$

$x = 4$

(14) Solve $3x = 2(x+8)$

$3x = 2x + 16$

$3x - 2x = 2x + 16 - 2x$

$1x = 16$

$x = 16$

(15) If $2x+1 = 4$ find $x+2$.

$2x+1-1 = 4-1$

$2x = 3$

$\frac{2x}{2} = \frac{3}{2}$

$x = \frac{3}{2}$

find $x+2 =$

$\frac{3}{2} + 2 =$

$\frac{3}{2} + \frac{2}{1} =$

$\frac{3}{2} + \frac{2}{1}\left(\frac{2}{2}\right) =$

$\frac{3}{2} + \frac{4}{2} =$

$\frac{3+4}{2} =$

$\frac{7}{2} =$

(16) If $4x-1=x$ find $30x$

(10)

$4x-1+1=x+1$

$4x=x+1$

$4x-x=x+1-x$

$4x-1x=1$

$3x=1$

$\frac{3x}{3}=\frac{1}{3}$

$x=\frac{1}{3}$

find $30x=$

$30\left(\frac{1}{3}\right)=$ Subst

$\frac{30}{1}\left(\frac{1}{3}\right)=$

$\frac{30}{3}=$

$10=$

(17) Solve $-2x<8$

$\frac{-2x}{-2}>\frac{8}{-2}$ Turn the alligator around since you divided by a negative.

$x>-4$

(18) Solve $2x<-6$

$\frac{2x}{2}<\frac{-6}{2}$ do not turn the alligator around since you divided by a positive.

$x<-3$

19. If $xy=k$ and $x=2$ when $y=10$ then find x when $y=5$.

11.

$xy=k$

$(2)(10)=k$ subst

$20=k$

$xy=20$ now

$x(5)=20$

$5x=20$

$\frac{5x}{5}=\frac{20}{5}$

$x=4$

20. Simplify $(3x-2)(x+5)=$

$3x^2+15x-2x-10=$

$3x^2+13x-10$

21. $(2xy^4)^2=$

$(2^1x^1y^4)^2=$

$2^2x^2y^8=$ Multiply Powers

$2\cdot 2x^2y^8=$

$4x^2y^8=$

(22) $(3+ax)(2x-1)=$

$6x-3+2ax^2-1ax=$

$6x-3+2ax^2-ax=$

(12)

(23.) Find C if $(3x-2)(4x+c)=12x^2+7x-10$

Note last times last is last

$-2c=-10$

$\frac{-2c}{-2}=\frac{-10}{-2}$

$c=5$

(24) Factor GCF $4x^3y-2x^2y^2=$

$4x^3y^1-2x^2y^2=$

$2x^2y^1(2x-1y)=$

$2x^2y(2x-y)=$

25. Factor GCF $4y-2=$

$2(2y-1)=$

26. Factor $\frac{x^2}{9}-64=$

formula $a^2-b^2=(a+b)(a-b)$

$\left(\frac{x}{3}\right)^2-(8)^2=$

$\left(\frac{x}{3}+8\right)\left(\frac{x}{3}-8\right)=$

27. Factor GCF

$8x^3+14x^2+12xy=$

$8x^3+14x^2+12x^1y^1=$

$2x^1(4x^2+7x^1+6y^1)=$

$2x(4x^2+7x+6y)=$

28. Simplify

$$\frac{5xy+y}{y} =$$

$$\frac{5xy}{y} + \frac{y}{y} =$$

$$5x + 1 =$$

29. Simplify

$$\frac{8n+4}{4} =$$

$$\frac{8n}{4} + \frac{4}{4} =$$

$$2n + 1 =$$

30. Solve

$$2x(x+5) = 0$$

Let $2x = 0$ OR $x+5 = 0$

$$\frac{2x}{2} = \frac{0}{2} \quad \text{OR} \quad x+5-5 = 0-5$$

$x = 0$ OR $x = -5$

(31) Solve $2x^2+5x-12=0$

$(2x-3)(x+4)=0$

Possible Factor (2,1)

12·1
6·2
3·4

(15)

Set $2x-3=0$ OR $x+4=0$

$2x-3+3=0+3$ OR $x+4-4=0-4$

$2x=3$ OR $x=-4$

$\frac{2x}{2}=\frac{3}{2}$

$x=\frac{3}{2}$

OR

Solve $2x^2+5x-12=0$ (by Quadratic formula)

$a=2,\ b=5,\ c=-12$

$$x=\frac{-b\pm\sqrt{b^2-4ac}}{2a}$$

$$x=\frac{-(5)\pm\sqrt{(5)^2-4(2)(-12)}}{2(2)}$$

$$x=\frac{-5\pm\sqrt{25+96}}{4}$$

$$x=\frac{-5\pm\sqrt{121}}{4}$$

$$x=\frac{-5\pm11}{4}$$

$x=\frac{-5-11}{4}$ OR $x=\frac{-5+11}{4}$

$x=\frac{-16}{4}$ OR $x=\frac{6}{4}$

$x=\frac{k(3)}{k(2)}$

$x=-4$ OR $x=\frac{3}{2}$

32. Solve $3x^2+13x=10$ factor Possible (3,1) (10,1) (2,5)

$3x^2+13x-10=0$

$(3x-2)(x+5)=0$

16

set $3x-2=0$ OR $x+5=0$

$3x-2+2=0+2$ OR $x+5-5=0-5$

$3x=2$ OR $x=-5$

$\frac{3x}{3}=\frac{2}{3}$

$x=\frac{2}{3}$

OR

Solve $3x^2+13x-10=0$ (by Quadratic formula)

$a=3,\ b=13,\ c=-10$

$$x=\frac{-b\pm\sqrt{b^2-4ac}}{2a}$$

$$x=\frac{-(13)\pm\sqrt{(13)^2-4(3)(-10)}}{2(3)}$$

$$x=\frac{-13\pm\sqrt{169+120}}{6}$$

$$x=\frac{-13\pm\sqrt{289}}{6}$$

$$x=\frac{-13\pm17}{6}$$

$x=\frac{-13+17}{6}$ OR $x=\frac{-13-17}{6}$

$x=\frac{4}{6}$ OR $x=\frac{-30}{6}$

$x=\frac{2(2)}{2(3)}$ OR $x=-5$

$x=\frac{2}{3}$

(33) Solve $2x^2 = -7x - 3$

factor possible (2·1) (3·1)

(17)

$2x^2 + 7x + 3 = 0$

$(2x+1)(x+3) = 0$

Let $2x+1=0$ OR $x+3=0$

$2x+1-1 = 0-1$ OR $x+3-3 = 0-3$

$2x = -1$

$\frac{2x}{2} = \frac{-1}{2}$ OR $x = -3$

$x = -\frac{1}{2}$

OR

solve $2x^2 + 7x + 3 = 0$ (use Quadratic formula)

$a=2,\ b=7,\ c=3$

$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

$x = -\frac{(7) \pm \sqrt{(7)^2 - 4(2)(3)}}{2(2)}$

$x = \frac{-7 \pm \sqrt{49 - 24}}{4}$

$x = \frac{-7 \pm \sqrt{25}}{4}$

$x = \frac{-7 \pm 5}{4}$

$x = \frac{-7-5}{4}$ OR $x = \frac{-7+5}{4}$

$x = \frac{-12}{4}$ OR $x = \frac{-2}{4}$

$x = -3$ OR $x = \frac{2(-1)}{4(2)}$

OR $x = -\frac{1}{2}$

(34) Solve $8x^2 - 1 = 7x$ factor

$8 \cdot 1$, $1 \cdot 1$, $2, 4$

(18)

$8x^2 - 7x - 1 = 0$

$(8x+1)(x-1) = 0$

Let $8x+1=0$ OR $x-1=0$

$8x+1-1 = 0-1$ OR $x-1+1 = 0+1$

$8x = -1$ OR $x = 1$

$\frac{8x}{8} = \frac{-1}{8}$ OR

$x = -\frac{1}{8}$

OR

Solve $8x^2 - 7x - 1 = 0$ (use Quadratic formula)

$a=8,\ b=-7,\ c=-1$

$$x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$$

$$x = \frac{-(-7) \pm \sqrt{(-7)^2 - 4(8)(-1)}}{2(8)}$$

$$x = \frac{7 \pm \sqrt{49+32}}{16}$$

$$x = \frac{7 \pm \sqrt{81}}{16}$$

$$x = \frac{7 \pm 9}{16}$$

$x = \frac{7-9}{16}$ OR $x = \frac{7+9}{16}$

$x = \frac{-2}{16}$ OR $x = \frac{16}{16}$

$x = \frac{2(-1)}{2(8)}$ OR $x = 1$

$x = -\frac{1}{8}$ OR

35. Solve $x^2+8x+11=0$ (use Quadratic formula)

$a=1,\ b=8,\ c=11$

19

$$x=\frac{-b\pm\sqrt{b^2-4ac}}{2a}$$

$$x=\frac{-(8)\pm\sqrt{(8)^2-4(1)(11)}}{2(1)}$$

$$x=\frac{-8\pm\sqrt{64-44}}{2}$$

$$x=\frac{-8\pm\sqrt{20}}{2}$$

$$x=\frac{-8\pm\sqrt{4*5}}{2}$$

$$x=\frac{-8\pm\sqrt{4}\sqrt{5}}{2}$$

$$x=\frac{-8\pm2\sqrt{5}}{2}$$

$$x=-4\pm1\sqrt{5}$$

$$x=-4\pm\sqrt{5}$$

$x=-4-\sqrt{5}$ OR $x=-4+\sqrt{5}$

Primes 2, 3, 5, 7, ...

$2\overline{)20}$
$2\overline{)10}$
$5\overline{)5}$
1

$20=2\cdot2\cdot5$